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National Forest System Lands in Idaho

Minerals Specialist Report

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Abstract

On National Forest System (NFS) lands, minerals are classified according to the law under which they are managed. Minerals are classified as locatable, leasable, and salable (common variety). This distinction is important because each classification is subject to different requirements for exploration and development, and in the case of locatable minerals, the Forest Service cannot prohibit exploration and development. This report presents the “affected environment” for minerals within Idaho Roadless Areas, which is a general overview of the occurrence and development potential for each of the three mineral classifications. In addition, the affected environment section discusses abandoned mines and facilities, energy corridors, alternate energy and geological and paleontological resources.

The “Results” section of this report discusses the indirect and cumulative effects on the ability to develop mineral resources of each of the four alternatives. None of the alternatives will have any direct effects on mineral resource development due to: 1) the exclusion of outstanding mineral rights granted by lease or statute; and 2) the projected effects will occur at a later time and therefore by definition are considered indirect. This section also discusses the effects to geological and paleontological resources, alternate energy resources, and the ability to reclaim abandoned mines/facilities under each of the alternatives.

Changes Between Draft and Final

All sections

- Added discussion of new alternative, Alternative 4, Modified Idaho Roadless Rule

Leaseable Minerals

Oil and gas:

- Updated information on potential for development

Geothermal:

- Updated acres associated with management themes base on correction to data – Appendix E.

Phosphate:

- Added discussion about total amount of phosphate deposits in Idaho
- Updated acres leased and unleased based on further review of BLM records
- Updated information regarding Smoky Canyon Mine

Abandoned and Inactive Mines

- Added discussion on “orphaned” mines
- Added discussion on phosphate mines and CERCLA sites

Other

Added sections on wind energy and wood biomass

Analysis

Methodology

This report mimics the format and approach followed in the Minerals Specialist Report that was prepared for the 2001 Roadless Area Conservation Rule. Each classification of minerals is generally discussed, followed by a more focused discussion on the mineral resources with development potential in Idaho's roadless areas.

Assumptions

General

- The location and density of existing roads within Idaho Roadless Areas would not alone be adequate to allow leasable minerals to be efficiently and economically developed. Therefore, the prohibition of road construction or reconstruction would severely restrict any leasable mineral activity on lands where the prohibition exists. This assumption is supported by recent actions taken by two lessees of 27 oil and gas leases covering 57,004 acres containing roadless areas in Utah's Uinta National Forest. Upon learning that their leases would be subject to the reinstated 2001 roadless rule, these lessees requested the BLM suspend their leases, asserting that they were "prevented from operating on the leases."
- Directional drilling technology may be used to explore portions of leases designated as "no surface occupancy" adjacent to areas where surface occupancy may be allowed, but it would not be the principle means to explore for geothermal or oil and gas resources in Idaho Roadless Areas. Industry would not likely incur the extra expense of directional drilling without the promise of the full economic enjoyment of the entire lease area. This is particularly true in relatively unexplored areas such as Idaho's Roadless Areas, where the complex geology and lack of known commercial production greatly increase the financial risk of drilling.
- Restricting surface occupancy on leases within Idaho Roadless Areas will severely restrict development of the leased mineral resource. This is due to that directional drilling wouldn't be economically feasible given the expanse of the occupancy prohibition combined with a lack of private inholdings or adjacent non-roadless area lands where occupancy would be allowed.
- Given areas with equal mineral resource potential, industry will be inclined to conduct activities on non-roadless areas first because it would be less expensive to develop access.

Coal

- There is no potential for coal development because currently there are no existing leases or pending lease applications on NFS lands in Idaho and no demonstrated industry interest; consequently, no foreseeable activity is anticipated for exploration or development of coal reserves.

Geothermal

- Geothermal resources would be developed to some degree in Idaho Roadless Areas if road construction, reconstruction, and surface occupancy were permitted; however, as noted in the general assumptions, exploration and development would focus outside Idaho Roadless Areas.
- The six pending geothermal lease applications for 11,130 acres in the Boise National Forest, which includes about 7,000 acres of the Peace Rock Roadless Area, and the three geothermal lease applications for 5,590 acres in the Salmon National Forest, which includes about 33 acres of the West Panther Creek Roadless Area, are expected to be offered for lease in the foreseeable future. Whether or not the roadless acreage in these applications is actually leased depends on what kind of road restrictions, if any, apply.

Phosphate

- There will be only one operating phosphate mine (Smoky Canyon) impacting Idaho Roadless Areas for the foreseeable future.
- All known phosphate deposits would be developed if road construction, reconstruction, and surface occupancy were permitted. This is an overly conservative assumption, as all leased lands may not be completely developed and in the case of unleased lands, some lands may be determined unsuitable for leasing at the leasing analysis stage.
- The history of phosphate development in the area has shown that lease modifications or fringe acreage leases are a regular occurrence to avoid the waste of isolated blocks of phosphate ore. Using a ratio of existing leased acres outside of known phosphate lease areas (KPLA) to leased acres inside of KPLA in the Caribou-Targhee National Forest, these kinds of leases could add up to 14 percent to the acres of leased KPLA where mining may occur.

Salable

- Demand for mineral materials from NFS lands will remain constant for the foreseeable future.

Information Used

Information used in this analysis came from two main sources:

- Agency sources, such as national databases, forest plans, mineral-related environmental analyses, and personnel at the forest level.
- Other than agency sources, such as the U.S. Geological Survey and Dept. of Energy publications, USDI Bureau of Land Management (BLM) national databases and personal communications, State of Idaho websites and publications, etc.

Affected Environment

Locatable Minerals

Locatable minerals include commodities like gold, silver, molybdenum, copper, lead, zinc, cobalt, uranium, dimension stone, and certain varieties of limestone, which are subject to appropriation under the General Mining Law of 1872 (17 Stat. 91, as amended). This law provides United States citizens a possessory right to prospect, explore and develop these minerals on public domain lands. It also provides for reasonable access to conduct these activities. Depending on the stage of exploration or development, reasonable access can range from unimproved temporary roads for prospecting or drilling to more permanent improved roads for full mine development and transportation of ore. By virtue of the Organic Administration Act (16 U.S.C. §§ 482), this possessory right is subject to rules and regulations of the Forest Service on NFS lands.

Valuable deposits of locatable mineral resources potentially exist in Idaho Roadless Areas. Therefore, in the long term, it is reasonable to assume that future exploration, mining, and mineral processing activities will continue to occur in Idaho Roadless Areas where valuable deposits exist. While it is not possible to predict where and when development will occur, the existence of active mining claims within a given roadless area is an indicator of both potential for a valuable mineral deposit and for future mineral-related activity. Of the 281 Idaho Roadless Areas, 102 of them contain an estimated 2,085 active mining claims¹. The number of claims within roadless areas is subject to change as new claims are staked and others are allowed to lapse by claimholders.

Exploration and development of locatable mineral resources are non-discretionary activities, meaning that the Forest Service cannot prohibit reasonably necessary activities required for the exploration, prospecting, or development of valuable mineral deposits. However, the Forest Service has the authority and the obligation to regulate locatable mineral operations in order to prevent or minimize damage to NFS surface resources. This is the purpose of regulations found at 36 CFR 228, Subpart A. In support of this obligation, a forest manager may direct a certified mineral examiner to conduct a surface-use determination (SUD) to ensure that a proposed mineral exploration or development activity conforms to reasonable industry standards for that type of activity, based on the appropriate stage of development of the operation. If the SUD concludes that the proposed activity is not reasonable, the forest manager would inform the operator that changes or additions are needed in order for the proposal to be approved under 36 CFR 228.

Leasable Minerals

Leasable minerals are those minerals that can be explored for and developed under one of several federal mineral leasing acts. Leasable minerals in Idaho include energy mineral resources such as oil, gas, and geothermal and non-energy minerals such as phosphate. Moreover, for lands acquired or administered under the Weeks Act (PL 61-435) and the Bankhead-Jones Act (PL 75-210), the 1872 Mining Law does not apply and deposits of otherwise locatable minerals like gold and garnet are leasable.

¹ Bureau of Land Management LR2000 Database; June 2007

The Government's decision regarding whether to lease leasable mineral resources is discretionary, meaning that leasing may or may not be allowed. However, once issued, a lease then becomes an irretrievable commitment of resource; they cannot be cancelled by the government, except by due process when the lessee does not meet the terms and conditions of the lease. The BLM has the exclusive authority to dispose of leasable mineral resources on NFS lands. However, BLM must have the consent of the Forest Service before it can lease oil, gas, or geothermal resources. In the case of phosphate, BLM must seek Forest Service recommendations for measures to protect surface resources, but may lease without Forest Service consent. A federal lease conveys to the holder the right to explore and develop the leased commodity subject to lease terms, stipulations, and applicable regulations.

Although it varies by commodity, surface use associated with the exploration and development of leasable minerals requires access and haul roads, open pits, facilities, power lines, pipelines, and communication sites. Efficient exploration and development of leasable minerals is generally not possible without the ability to build new roads or reconstruct existing roads where needed. In the case of oil, gas, and geothermal resources, industry has the capability to avoid disturbing sensitive surface resources by using directional drilling techniques. However, directional drilling has technical and economic limitations. For the purposes of this report, it is assumed that it would not be widely used in Idaho as a principal means to explore and develop leasable minerals because of economic and technological limitations such as unknown mineral resource potential and complex geology.

An environmental impact statement is generally prepared on a forest-wide basis to support leasing decisions. This analysis would also address leasing within Idaho Roadless Areas. The effects of any future lease exploration or development are also addressed in subsequent environmental analyses, which may be another site-specific environmental impact statement.

Geothermal— Geothermal resources are underground reservoirs of hot water or steam created by heat from the earth. Geothermal steam and hot water can reach the surface of the earth in the form of hot springs, geysers, mud pots, or steam vents. These resources also can be accessed by wells, and the heat energy can be used for generating electricity or other “direct uses”, such as heating greenhouses, homes, commercial buildings, and aquaculture operations or for dehydrating vegetables. Direct uses of geothermal energy do not require the intermediate to high temperatures required for power generation. Geothermal is a “clean” energy source in that it does not produce any greenhouse gases.

The full extent of Idaho's geothermal resource potential has yet to be discovered. The temperatures of Idaho's highest potential geothermal resources tend to be lower than 110° C, which generally makes them unsuitable for power generation.² However, Idaho has recently experienced the construction start of its first commercial geothermal power facility on private land at Raft River in 2006. The Raft River facility will use binary power plant technology which is able to use lower temperature geothermal to indirectly heat a fluid with a lower boiling point to run the plant's turbines. Once completed, the Raft River facility will have an electric-generating capacity of 13 Megawatts. A megawatt is enough energy to power about 300 homes. In addition to this single electrical-generating facility, Idaho also hosts 73 operating direct use

² Farhar, Barbara C. and Heimeller, Donna M.; 2003, Opportunities for Near-Term Geothermal Development on Public Land in the Western United States, Technical Report, National Renewable Energy Laboratory, p.9

facilities at over 40 separate resource areas in the state.³ This relatively limited geothermal development throughout the State has been attributed to years of low-cost hydroelectric power.

The Geothermal Task Force of Western Governor's Association estimated that Idaho has 855 MW of near-term economic potential resources (i.e. by 2015) and 1,670 Megawatts (MW) of long-term potential (by 2025). This report gives 305 MW at six identified sites and 550 MW at "other Idaho sites" that are not named in the report⁴. One of the six identified sites, Big Creek Hot Springs, is on the Salmon National Forest (located in or near an inventoried roadless area) and is projected to have a near term resource capacity of 10 megawatts. Other than the resource estimate for the single site in the Salmon National Forest, there is no overall estimate of geothermal resource capacity of Idaho's National Forests or its Roadless Areas.

In the late 1970's – early 1980's, there was interest in geothermal leasing in National Forest land in the Island Park area of the Targhee National Forest, at Vulcan Hot Springs in the Boise National Forest, and at Big Creek Hot Springs in the Salmon National Forest. Although some NFS lands in Idaho were leased for geothermal, the leases were never developed and eventually expired. Presently, there are no geothermal leases on NFS lands in Idaho. Higher energy prices and new legislative incentives contained in the 2005 Energy Policy Act have renewed interest in geothermal leasing. In August 2005, Ormat Nevada Incorporated (Ormat), an active company in the geothermal power industry, filed six geothermal lease applications for 11,130 acres in the Boise NF, which includes 6,976 acres of the Peace Rock IRA. Ormat also filed another three geothermal lease applications for 5,591 acres in the Salmon NF, which includes about 33 acres of the West Panther Creek IRA.

None of the Idaho National Forests have a current leasing decision for geothermal resources. The BLM and Forest Service have initiated a national programmatic environmental impact statement (EIS) for geothermal development to assist in geothermal leasing and permitting on BLM public lands and National Forest lands. The draft programmatic EIS was released for public review in June 2008 (US Department of Energy, USDI BLM, USDA Forest Service 2008). When completed, the EIS will help the Forest Service decide about whether or not to allow BLM to lease lands with medium to high geothermal potential, including the lands contained in the Boise and the Salmon-Challis applications.

A regional geothermal resource assessment produced in February 2002 by the Southern Methodist University (SMU) Geothermal Heat Laboratory was used in this report to provide an indication of the geothermal resource potential of Idaho Roadless Areas. The SMU report produced a qualitative composite of information on heat flow, thermal gradient, sediment thickness, and hot springs. Based on these variables, the assessment produced digital map coverage of broad areas of geothermal resources and rated these resources as having high, medium, or low development potential.⁵ Figure 1 shows the extent of the high, medium, and low areas of geothermal potential in Idaho. The SMU map, a more optimistic projection, is one of a number of available maps that portray Idaho's geothermal potential. A more conservative

³ Fleischmann, Daniel J.; 2006, Geothermal Development Needs in Idaho, Geothermal Energy Association, 51 p.

⁴ Geothermal Task Force of Western Governor's Association (WGA) – January 2006: <http://www.westgov.org/wga/initiatives/cdeac/Geothermal-full.pdf> (page 65)

⁵ Farhar, Barbara C. and Heimeller, Donna M.; 2003, Opportunities for Near-Term Geothermal Development on Public Land in the Western United States, Technical Report, National Renewable Energy Laboratory, CD

projection showing Idaho's geothermal potential can be found on the Idaho Department of Water Resources website at www.idahogeothermal.org. Other geothermal potential maps that include Idaho can be viewed at www.eere.energy.gov/geothermal/geomap.html and www.smu.edu/geothermal/2004NAmap.htm. Although these maps are helpful in identifying where there is geothermal potential, there has not been any history of geothermal activities on NFS lands to predict specifically where, what kind, or how much actual geothermal development would occur within the specified potential areas.

Table 1 summarizes the acres of geothermal potential from the SMU report for both Idaho roadless areas and non-roadless area Forest Service lands in Idaho.

Table 1. Acreage of geothermal resource potential on NFS lands in Idaho

Geothermal resource potential	High	Medium	Low	Total
Inside Idaho Roadless Areas	4,837,400	3,961,500	505,500	9,304,400
Outside Idaho Roadless Areas	5,370,800	5,389,200	1,436,300	12,196,300
Total NFS lands	10,208,200	9,350,700	1,941,800	21,500,700

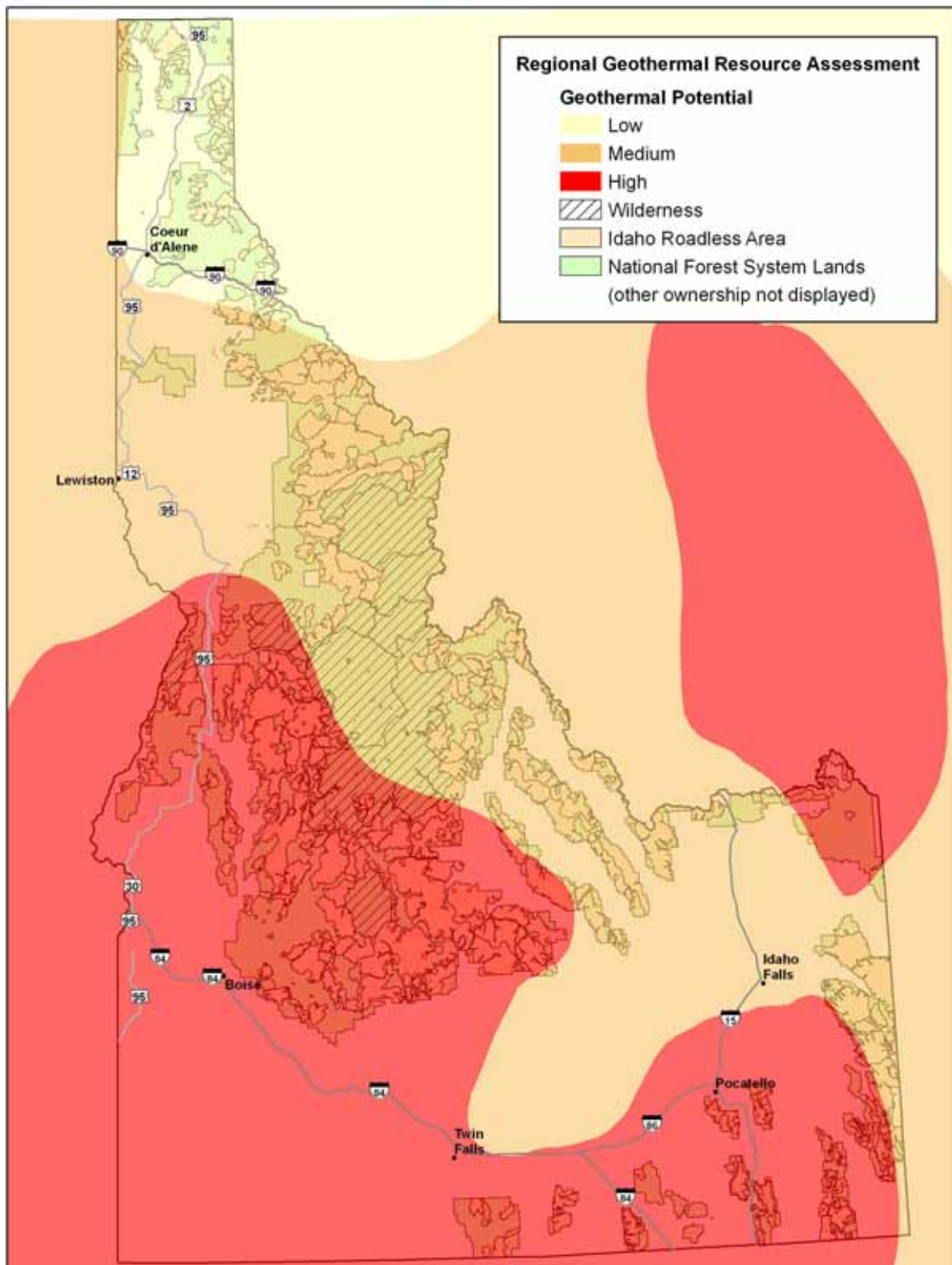


Figure 1. Overlap of Idaho Roadless Areas and geothermal potential

Given the substantial amount of acres that exists outside of roadless areas (both Forest Service and non-Forest lands), it is assumed that for the foreseeable future, geothermal exploration and development activities will principally occur on these lands rather than trying to contend with surface resource issues and remoteness of Idaho Roadless Areas. However, with nearly 8.8 million acres of high and medium geothermal potential within roadless areas, it is reasonable to expect there will be some interest in leasing, exploration, and development of geothermal resources in Idaho Roadless Areas where road construction or reconstruction is allowed. The pending lease applications in the Boise and Salmon National Forest's support this expectation.

With a lack of lease or development history for geothermal on NFS lands in Idaho, there is no trend data to project the amount of geothermal exploration and development activities that might occur on Idaho Roadless Areas. Instead, the following discussion provides a general description of the activities, facilities, and surface disturbance that could be expected on a geothermal lease that would be developed for electrical generation. Because of the variety of other uses for which geothermal resources might be used, the surface impacts of potential direct uses are not individually discussed. However, surface impacts of direct use are small in comparison to those associated with electrical power generation.

In the first stages of exploration, a lessee will drill a number of shallow temperature gradient wells to determine both the area-wide extent of the temperature differences and where the highest temperature gradient occurs. Temperature gradient wells can be drilled using a truck-mounted rig and can be up to 500 feet deep. Whenever possible, temperature gradient wells would be drilled using existing roads for access. When existing roads are not available, new access roads may need to be constructed for the truck-mounted rig to reach the drill site. Usually temperature gradient holes do not require a well pad; however preparing the site for drilling could include leveling the surface and clearing away vegetation. The shallow depth of the drill holes and the smaller drilling equipment requires much less surface disturbance than that associated with deep well drilling.

If results of temperature gradient wells are favorable, deep exploratory test well drilling would likely follow to determine with certainty the existence of a geothermal reservoir and its suitability for commercial development. Conventional oilfield drilling rigs, adapted for geothermal work, are used to drill deep wells. The size of the well pad needed to provide enough space for the drilling equipment varies with depth, but averages about 3 acres.

Roads would be needed to accommodate drilling and servicing of wells. Existing roads would be used wherever possible, but it is expected that some of the existing roads would be upgraded and that new, temporary and permanent access roads would be constructed. Temporary roads would average about 30 feet in width from the top of the road cut to the bottom of the road fill, while permanent roads would be about 50 feet wide.

If a geothermal resource is discovered, the well is tested to determine the characteristics of the reservoir. Further drilling would be anticipated to provide multiple wells for development and production. A typical 40-megawatt binary power plant would require 8 production wells and 4 injection wells. Geothermal resource development could involve constructing the infrastructure needed to produce the geothermal reservoir. The type of development that occurs would be based on the size and temperature of the geothermal reservoir. Pipelines would be necessary to transport hot water or steam from wells to power plants or other facilities for use. The pipelines that carry the hot water or steam are usually 24 to 36 inches in diameter and are covered with insulation. When feasible, they would parallel the well site access roads and other existing

roads. The pipelines are usually located above ground to allow for the large amount of expansion and contraction associated with hot water or steam. Each pipeline would be expected to require about a 30-foot wide right-of-way. The length of pipeline through which geothermal water or steam can be carried is limited by potential energy losses. Consequently, geothermal production wells are typically within 1-2 miles of the power plant.

The conversion of geothermal energy into electrical power is an adaptation of the basic power cycle used in fossil-fueled electrical generating plants. The geothermal steam drives the turbine-generator in the same way as would steam produced in a boiler fired by oil or coal. Three types of power plants that harness geothermal resources are dry steam plants, flash steam plants, and binary cycle plants. Based on the assumption that developers would use the latest technology, any future power plants in Idaho would probably be binary type. A typical binary power plant would occupy about 5 to 10 acres. Binary cycle power plants use water from the geothermal reservoir to heat another "working fluid." The working fluid is vaporized and used to turn the turbine-generator units. The geothermal water and the working fluid never come in contact with each other. Binary cycle power plants can operate with lower water temperature 107°C to 182° C (225°F to 360°F) and produce few air emissions (U. S. Bureau of Land Management 2002)⁶.

Energy production from a geothermal facility could last up to 30 years or longer and involves the operation and maintenance of the geothermal field and includes new drill sites. The drilling of new production wells, if necessary, in order to sustain or enhance a geothermal field would involve drilling and impacts that are similar to those discussed above in the development phase. Transmission lines are needed to transmit electricity from the power plant to distribution lines. Each line would require an average of a 40-foot wide right-of-way. After production ceases all wells are plugged and all disturbed areas are reclaimed in conformance with Forest Service and BLM standards. Reclamation includes removing all surface equipment and structures associated with power generation, re-grading the site to pre-disturbance contours, and replanting native vegetation.

Oil and Gas—Since 1903, about 145 wells have been drilled throughout Idaho exploring for oil and gas, but not one has yet yielded a commercial discovery. The 1970's and 1980's saw extensive interest in eight of Idaho's ten National Forests with nearly 7.8 million acres of NFS lands reportedly leased for oil and gas (BLM; LR2000 database).⁷ Only the Boise and the Wallowa-Whitman National Forests avoided this period of leasing interest. With no commercial discovery of hydrocarbons, all of those early oil and gas leases on NFS lands have expired. In December 2007, one oil and gas lease was issued for 1,527 acres in the Bear Creek roadless area of Targhee National Forest and represents the only active oil and gas lease on National Forests in Idaho.

With a relatively sparse history of exploratory drilling and no commercial oil and gas production in the State, the extent of oil and gas resources on Idaho's National Forests and their associated roadless areas is largely unproven. Presently, the occurrence potential for oil and gas is unknown to low in all Idaho Forests with the exception of the Caribou-Targhee (C-T) National Forest. The BLM and Forest Service geologic reports prepared in connection with area

⁶ U.S. Bureau of Land Management. 2002. *Environmental Assessment for Leasing of Geothermal Resources Managed by the Bureau of Land Management Carson City Field Office.*

⁷ Bureau of Land Management LR2000 Database; June 2007

leasing analyses, have identified the occurrence potential in this NFS unit as medium to high due to being located within the Wyoming Thrust Belt province, a geologic area favorable to the occurrence of hydrocarbons. While there is potential for occurrence of hydrocarbons on these NFS lands, the potential for development is much less certain. This is evident in a 2003 USGS assessment of undiscovered oil and gas resources within the Wyoming Thrust province. This assessment made an allocation of the potential for undiscovered oil and gas reserves for individual States within the assessment unit. Idaho, which made up 38.4 percent of the assessment unit area, was allocated none of the undiscovered oil resources, and only 1 percent of the undiscovered gas resources.⁸

The Reasonable Foreseeable Development Scenario (RFDS) prepared for the Targhee National Forest oil and gas leasing analysis, projected that 10 exploratory wells would be drilled on the Forest over a 15 year period (Horsburgh, 1992)⁹. The Scenario assumed that each well would need an average of 6 miles of new road construction. It predicted seven wells would be drilled in the Palisades area; two wells on the west side of Teton Valley or south of Palisades Reservoir; and one well would be in the northern part of the Forest. The February 2000 Targhee National Forest oil/gas leasing decision made much of the Forest either unavailable for leasing or available for leasing, but with a No Surface Occupancy (NSO) lease stipulation. Because the NSO blocks are large, and sometimes adjacent to no-lease areas, any oil and gas leases that would be issued within the Targhee would be difficult to develop because surface occupancy, required for drilling, is not allowed. In the eight years since the Targhee leasing decision, only two leases have been issued. One of these leases terminated when the lessee failed to pay the required rental and the second was just recently issued in December 2007. No oil and gas wells have been drilled since the Targhee's leasing decision was made in 2000.

In light of higher energy prices, oil and gas interest in the vicinity of the Caribou National Forest has increased. In addition to a number of leases having recently been issued on BLM and State lands adjacent to the Forest, an exploratory well was started on private land near Grays Lake in the fall of 2007 within two miles of the Forest. Information on the results of this drilling is not yet available. In 2005, 200,000 acres of land in the Caribou-Targhee National Forest were nominated by industry for oil and gas leasing. Responding to this request, the Forest has initiated a leasing analysis for Caribou portion of the Forest and the Curlew National Grassland. The RFDS prepared for the analysis projects four exploratory wells will be drilled on the Caribou over the next 15 years. (Robison, 2007)¹⁰ Three of the wells are projected to be on the Soda Springs and/or eastern part of the Montpelier Ranger District (RD) and the other on the Bear River Range (western) portion of the Montpelier RD. Similar to the Targhee scenario, for analysis purposes, each well is predicted to require six miles of new access road to be constructed.

⁸ Kirschbaum, Mark A., Seventh Approximation – Data Form for Conventional Assessment Units, Wyoming Thrust Belt Province, U.S. Geological Survey; National Oil and Gas Assessment, September 2003 p.4 <http://certmapper.cr.usgs.gov/data/noga00/prov36/tabular/c360101.pdf>

⁹ Horsburgh, Charles; 1992, Reasonable Foreseeable Development Scenario (p.21), Appendix A of the Final Environmental Impact Statement for the Targhee National Forest's Oil and Gas Leasing Analysis, February 2000

¹⁰ Robison, Steve, Reasonable Foreseeable Development Scenario for Oil and Gas Development for Caribou National Forest and Curlew National Grassland, May 2007

Although the development scenarios for the Targhee and the Caribou provided overall number of wells and general areas where the new wells could be reasonably expected, they did not specify whether or not wells would be located within an inventoried roadless area.

Phosphate – The Caribou-Targhee National Forest contains significant deposits of economically recoverable phosphate that is used in the production of fertilizers, animal feed, and elemental phosphorus. Idaho phosphate production is a significant national resource. Phosphate production from the three active Idaho mines and one active mine in Utah represented about 15 percent of total U.S. marketable production in 2007 (U.S. Geological Survey, Mineral Commodity Summaries, January 2008). Royalty revenues from phosphate-related activity in Caribou County, Idaho, on Federal leases for fiscal year 2001 were almost \$9.34 million with about 90 percent of that generated from the national forest (USDA Forest Service 2003). Federal royalties in FY2007 had declined to around \$2.3 million (USDI Minerals Management Service 2008) as the active mines were producing principally from State and private land. Royalties should again increase as these mines advance into their other federal lease holdings.

Eastern Idaho is a part of the Western Phosphate Field, a broad area in the northern Rocky Mountains that contains phosphate-bearing layers of rock called the Phosphoria Formation. Although the Phosphoria Formation exists throughout all of eastern Idaho, a much smaller subset of this area has been classified as either prospectively valuable for phosphate or a known phosphate leasing area. On lands prospectively valuable for phosphate, geologic information indicates that phosphate *may* be present to satisfy economic guidelines of thickness, quality, depth below ground surface, and extent. Within the Caribou-Targhee, the Sawtooth, and the Salmon portion of the Salmon-Challis National Forests there are roughly 230,000 acres of roadless areas that have been classified by the U.S. Geological Survey as being prospectively valuable phosphate lands. (USGS, 1982)

From 1960 through the 1980's, the U.S. Geological Survey designated 80,170 acres of land in Southeastern Idaho as known phosphate lease areas (KPLAs). KPLA land contains identified economic or marginally economic phosphate deposits. Economic extraction of the phosphate from a KPLA is currently or potentially feasible. KPLA's are basically areas in proximity to where the Phosphoria formation is exposed at the surface. Federal phosphate deposits within a KPLA are subject to competitive leasing. The Caribou-Targhee National Forest is the only Idaho Forest with KPLA lands and contains 47,210 acres, or 59 percent, of KPLA lands in the State. Table 2 shows the breakdown of KPLA on the Forest.

Table 2. Acreage of KPLA on NFS lands in Idaho

KPLA	Outside Idaho Roadless Areas	Inside Idaho Roadless Areas
Leased	17,640	5,990
Unleased	9,120	14,460
Total	26,760	20,450
Already Mined Out	4,920	30

The Targhee portion of the Caribou-Targhee National Forest currently has three active phosphate leases totaling 1,694 leased acres. Of the leased acreage in the Targhee, 1,090 acres are within the Mt. Jefferson Roadless Area. These leases were issued in the mid-1950's and some mining occurred shortly thereafter on the leased portions outside the adjacent roadless area.

There has been no phosphate activity in the area for many years and none is expected in the foreseeable future.

The Caribou portion of the Caribou-Targhee National Forest currently has 49 active phosphate leases affecting 22,000 acres¹¹ of NFS lands. Of these active leases, approximately 6,140 acres are within six Idaho Roadless Areas (Dry Ridge, Huckleberry Basin, Meade Peak, Sage Creek, Schmid Peak, and Stump Creek). Almost all of the leased lands in roadless (6,100 acres) have yet to be mined. All the leased lands within roadless areas were issued prior to the effective date of the 2001 Roadless Rule. It is a common occurrence for existing leases to be modified to prevent the bypass or waste of mineable phosphate reserves that become evident as mining advances.

There are 14,460 acres of Idaho Roadless Areas that are unleased and located within Known Phosphate Lease Areas (KPLA) (fig. 2). Table 3 summarizes the acreage of KPLA's within Idaho Roadless Areas on the Caribou-Targhee National Forest. These lands may be leased either competitively upon application from industry or noncompetitively via modifications to existing leases or issuing fringe acreage leases. Lease modifications and fringe acreage leases are a relatively common occurrence to prevent the bypass or waste of mineable phosphate reserves that become evident as mining advances. KPLA's in the Caribou-Targhee National Forest generally exist on the edges of specific roadless areas, which would leave the core of the roadless areas intact should mining occur.

Table 3. Idaho Roadless Areas potentially affected by phosphate mining

Forest	Idaho Roadless Area	Acres under existing lease (leased acres w/in a KPLA) ¹	Percentage affected by existing leases	Unleased KPLA acres ²	Percentage affected by potential KPLA future leases	KPLA location
Caribou	Dry Ridge	1,400 (1,350)	7	780	4	Eastern edge
Caribou	Huckleberry Basin	2,090 (2,080)	13	2,120	13	Northwest edge
Caribou	Meade Peak	550 (550)	1	2,470	6	Northeast edge
Caribou	Sage Creek	1,900 (1,850)	22	2,080 ³	24	Southern portion
Caribou	Schmid Peak	40 (40)	<1	20	<1	Eastern edge
Caribou	Stump Creek	160 (120)	<1	120	<1	Southern edge
Caribou Totals		6,140 (5,990)		7,590		
Targhee	Bald Mountain	0 (0)	0	1,430	9	Northeast edge
Targhee	Bear Creek	0 (0)	0	5,060	5	Northeast edge
Targhee	Poker Peak	0 (0)	0	380	2	Northeast edge
Targhee	Mount Jefferson	1,090 (0)	2	0	0	
Targhee Totals		1,090 (0)		6,870		
Forest Totals		7,230 (5,990)		14,460		

¹ Not all existing lease acres are within a KPLA (known phosphate lease area).

² Estimated acres do not include ½-mile buffer added to the Caribou's KPLAs to allow for additional facilities needed for exploration and/or mine operations if lease is approved.

³ 840 acres in Sage Creek Roadless Area are recommended to be unavailable for lease per 1998 FS recommendation. An additional 200 acres may also be withheld from leasing unless industry can demonstrate that selenium concerns can be addressed. .

¹¹ This acreage is based on GIS which is different than the lease total shown in BLMs LR2000 database.

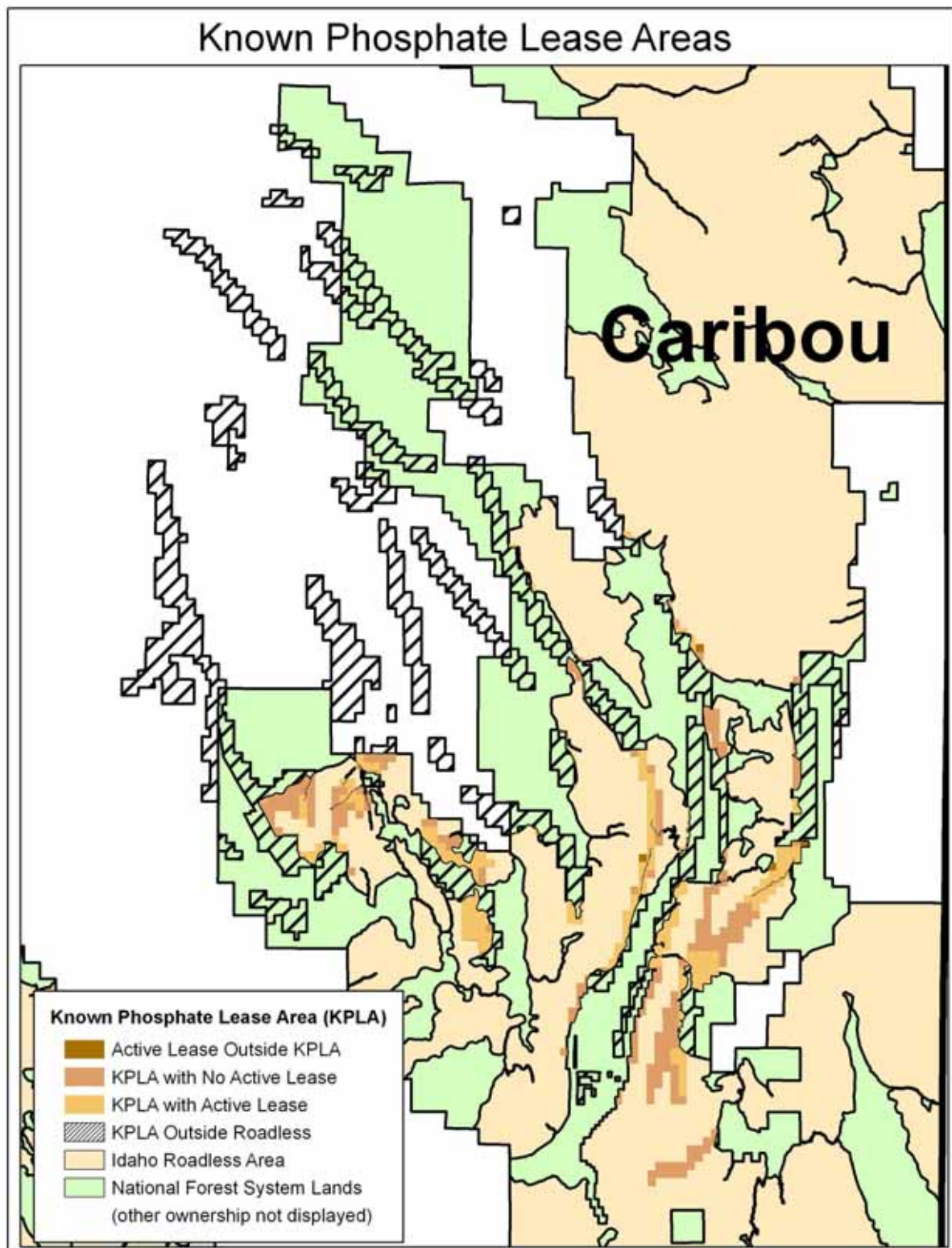


Figure 2. Overlap of Idaho Roadless Areas and existing phosphate leases and known unleased phosphate deposits.

Phosphate is currently being surface mined from two mines located on the Caribou portion of the forest, the Dry Valley Mine and the Smoky Canyon Mine. Operations at a third mine on the Caribou, the North Rasmussen Ridge mine, have been temporarily suspended, but are expected to resume within the next 3 years. A fourth mine, the Enoch Valley Mine is operating on a State lease within the administrative boundary of the Forest. The Dry Valley Mine and the North Rasmussen Ridge mine are not operating near roadless areas and will not be impacting roadless areas for the foreseeable future (J. Cundick 2007 pers. comm.). The Smoky Canyon Mine currently is not operating within a roadless area, but is projected to advance its mining operations to leased lands within the Sage Creek and Meade Peak Roadless Areas within the next 15 years. There are currently no other proposed mine plans involving NFS lands. While exploration and mine permitting process may be initiated within other roadless areas, for analysis purposes it will be assumed the Smoky Canyon Mine will be the only operating phosphate mine within roadless areas in the foreseeable future.

A final EIS was completed for a proposed expansion of the Smoky Canyon Mine (USDI BLM, USDA Forest Service, 2007). The Smoky Canyon expansion proposes to mine about 2 million tons of phosphate ore per year from 2,080 acres of leased lands. The proposed mine plan expansion would disturb a total of 1,340 acres, which includes 1,040 acres of surface in the Sage Creek Roadless Area and 60 acres in the Meade Peak Roadless Area. About 320 acres of the total surface disturbance within the roadless areas is proposed to occur off existing lease holdings or on proposed lease modifications.¹²

Over the 16-year life of the project, the Smoky Canyon Mine expansion would construct about 8 miles of main haul road, which includes 4.4 miles within the two roadless areas, disturbing about 124 acres. With an operating width of 100 feet, main haul roads require an overall disturbance with of 100 to 500 feet, depending on terrain. In addition to the main haul road, 980 acres of disturbance would occur within the two affected roadless areas as the surface mine, soil and overburden storage piles, other access roads, settling ponds, ditches, and power lines are developed.

As the surface mine advances, it follows the long, linear surface outcrop pattern of the phosphate deposits. Fully developed, the active pit area would be several hundred feet wide and 200–400 feet deep (fig. 3). The mining operation continues along the trend of the deposit, backfilling and reclaiming the pit as the ore is removed (fig. 4). The mine would be a 24-hours-per-day operation as the overburden and ore are drilled, blasted, loaded, and hauled using a shovel-and-truck fleet. All surface disturbances would be reclaimed after the project is completed with the exception of about 70 acres (steep pit walls and a section of road that would be left for future use). An average of about 70 acres of the roadless areas would be of disturbed per year (1,100 acres/16 years).

Best management practices (BMP's) for selenium controls have been employed at active phosphate mines in Southeastern Idaho since 2000 and are undergoing continual improvement. The Smoky Canyon Mine expansion would employ a variety of environmental commitments and BMP's to reduce the potential for selenium mobilization and migration from the mine site, including: pit backfilling, selective handling of overburden, use of low selenium chert for road

¹² There are about 520 acres within the Sage Creek Roadless Area involved with the proposed lease modifications, but only 180 acres would have surface disturbance. The remaining 140 acres of disturbance would occur off of existing or proposed leases.

construction, runoff and sediment control measures, and improved cover design for overburden (p.2-49 to 2-57; Appendices 2C and 2D; USDI BLM, USDA Forest Service, 2007). The operator would also be required to implement an extensive monitoring program to assess impacts to water, soils, vegetation, wildlife, and fisheries. Analysis of the Smoky Canyon preferred alternative, which employs the aforementioned BMP's, predicts there would be no exceedences of groundwater quality protection standards or surface water quality standards attributable to the proposed mining activities. (p. ES-10 and 4-109, USDI BLM, USDA Forest Service, 2007).

In addition to the Smokey Canyon Mine, there are about 3,700 acres of pending lease modifications, prospecting permits, and exploration license applications in the Caribou-Targhee National Forest. Given a history of phosphate deposits being leased outside of KPLA boundaries (table 3); it is assumed that the Caribou-Targhee has additional roadless areas outside KPLAs that are prospectively valuable for phosphate. Prospectively valuable lands outside of KPLAs would need further exploration to determine if a valuable deposit is present.



Figure 3. Open Pit



Figure 4. Reclaimed Pit

Coal – In the early part of the twentieth century, coal was produced from lands in the Targhee Unit of the Caribou-Targhee National Forest (Robison 2007). Later, in the 1980's, there were coal lease applications also in the Targhee Unit of the Caribou-Targhee National Forest. These applications were eventually closed when the applicant failed to respond to information requests (BLM LR2000 database). There currently are no existing leases or pending lease applications for coal on NFS lands in Idaho. Consequently, no foreseeable activity is anticipated to explore for or develop coal resources on Idaho Roadless Areas and will not be discussed further in this report.

Salable Minerals

Salable minerals are common varieties of sand, stone, gravel, soil, and clay. Generally, they are widespread and of low value, primarily used for construction or landscaping materials. Their value is dependent upon market factors, quality of the material, and availability of transportation. Disposal of these resources is at the sole discretion of the Forest Service and subject to the provisions of 36 CFR 228, Subpart C. Under these regulations, the Forest Service may either: 1) sell material for commercial use or for personal use by the public; 2) allow free use of material for limited personal use and for public projects by other federal agencies or State and local governments; or 3) use material itself for agency projects on NFS lands. The regulations also require that disturbance associated with mineral material sites is approved by the Forest Service in an operating plan that includes provisions to protect the environment and timely reclaim the surface.

Statewide production of mineral materials in Idaho averaged 22.67 million tons per year for the three year period from 2002 through 2004. In comparison, the total tonnage of mineral material dispositions from Idaho's National Forests reported for the fiscal years 2003 through 2005 are shown in table 3.

Table 3. Mineral material dispositions from Idaho national forests, fiscal years 2003–2005

Fiscal year	Sales	Free use	Forest Service use
	-----tons-----		
2003	14,856	31,867	122,220
2004	65,612	80,713	137,784
2005	64,303	78,149	131,905
Average	48,257	63,576	130,636

Thus the total average annual production of mineral materials from NFS lands represents just over one percent of the total mineral material production for all of Idaho. Although a specific breakdown of amounts of mineral materials generated from Idaho Roadless Area's is not available, an informal survey of minerals specialists in four National Forests with the largest reported mineral material tonnage, suggests that mineral material contributions from Idaho Roadless Area's are generally small and only used for public road projects (free use) or local Forest Service use¹³. This lack of commercial interest is likely due to: roadless areas being generally remote compared to where mineral materials are needed; the terrain is too rugged for developing such a low value commodity; and there is widespread availability of other mineral material sources outside of roadless areas.

The amount of road construction or reconstruction associated with the small volume of mineral materials produced from roadless areas is included in the 1 mile per year estimate for all non-timber road construction/reconstruction.

Abandoned and Inactive Mines

Abandoned and inactive mines sometimes pose public health and safety and/or environmental problems. On NFS lands where no responsible owner can be tied to a particular abandoned mine (i.e an orphan mine), the Forest Service would incur the cost to clean up the site. On mine sites where there is or the potential of a hazardous substance release and a responsible party (past owners/operators) can be identified, the Forest Service would seek cleanup by a responsible party under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (P.L. 96-510, Stat. 2767; 42 U.S.C. 9601, 9603, 9607, 9620) (CERCLA), more commonly known as the Superfund law. CERCLA allows the Forest Service to direct responsible parties to incur the costs to develop and implement plans to cleanup mines that release or threaten release of hazardous substances, pollutants, or contaminants. CERCLA may also be used to direct owners/operators of active mine mines to take action to remedy releases or threatened releases of hazardous substances.

A total of 315 abandoned mines and associated facilities have been identified to date on 66 Idaho Roadless Areas in Idaho's National Forests. The Forest Service inventory of abandoned mines on NFS lands is an ongoing process and therefore the number of abandoned mine sites within Idaho Roadless Areas will change as new sites are discovered and as discovered sites are reclaimed.

¹³ Personal Communication with Jim Egnew, Geologist, Payette National Forest; Jim Curtis, Mining Engineer, Boise National Forest; Jeff Gabardi, Mining Engineer, Sawtooth National Forest; Dave Sabo, Minerals Administrator, Salmon National Forest; Dean Morgan, Geologist, Challis National Forest.

It is common for abandoned mines to have existing road in place from when the mine was developed. Some road reconstruction may be needed to improve access to the mine itself to accomplish reclamation goals. However, these road improvements are only temporary as closing and reclaiming the mine roads is integral to achieving the overall reclamation goals of the abandoned mine land program.

In southeast Idaho, CERCLA authority is being used by Federal and State regulatory agencies to require involved mining companies to address the release of selenium to the environment at current and historic phosphate mines. Selenium, present in elevated levels in the geologic formation that hosts the phosphate ore, is an essential nutrient for humans and animals, but is toxic in high amounts. Selenium releases from these mines have had negative impacts to fish, wildlife, and domestic livestock in the vicinity of the mines. Beginning in 1997, a number of regional, area-wide, and site-specific investigations have been completed to provide a broad understanding of the sources, release mechanisms, transportation pathways, potential receptors, and known and potential environmental effects of selenium and other constituents of concern in the phosphate production area of Southeastern Idaho. The reports on these investigations are available on the Southeast Idaho Selenium Information System website at http://giscenter-ims.isu.edu/SISP/Area_Wide_Reports.html

Since 1999, a number of assessments of selenium's impacts to public health have been completed. The Bureau of Community and Environmental Health (BCEH), Division of Health, Idaho Department of Health and Welfare (IDHW), in a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), conducted public health assessments and consultations for the phosphate area in Southeast Idaho. As part of this cooperative agreement, BCEH released two health consultations in 1999 to evaluate selenium contamination in the groundwater and selenium contamination in beef, elk, sheep, and fish in the Resource Area. In 2003, BCEH released another health consultation to evaluate selenium contamination in fish in streams of the upper Blackfoot River watershed. In a February 2006 report, BCEH revisited the conclusions and recommendations made in past health consultations for groundwater, beef, elk, sheep, and fish. BCEH concluded the Southeast Idaho Phosphate Mining Resource Area constituted "no apparent public health hazard", but to be cautious, issued recommendations on: 1) the amount of Yellowstone Cutthroat and Brook trout children under the age of seven should eat from East Mill Creek due to selenium contamination; and 2) the amount of elk liver people can safely eat per month.¹⁴

There are 15 major operating and inactive phosphate mines in Southeastern Idaho that are being investigated for the release or threatened release of hazardous substances, including selenium.¹⁵ Of this total, 11 mines involve NFS lands on the Caribou portion of the Caribou-Targhee National Forest, including three that are or will be actively mining on the Forest. CERCLA authority is or would be used to address selenium releases at 9 of the 11 mines involving NFS lands. The remaining sites are actively mining and selenium issues will be addressed with authorities contained in the requirements for operating mines under the federal mineral leasing laws.

¹⁴ Bureau of Community and Environmental Health Division of Health, Idaho Department of Health and Welfare, Southeast Idaho Phosphate Mining Resource Area Bannock, Bear lake, Bingham, and Caribou Counties, Idaho EPA Facility ID: IDN001002245, February 24, 2006

¹⁵ Buck, Brian W. and Jones, Jeffrey L., Interagency/Industry Coordination to Respond to Selenium Contamination at Phosphate Mines in Southeastern Idaho. <http://www.fs.fed.us/geology/buck-jones.pdf>

Idaho Roadless Areas have only been minimally impacted by historic mining and any associated selenium releases. Of the 14,250 acres disturbed by phosphate mining in southeast Idaho to date, only 33 acres (in the Dry Ridge Roadless Area) has occurred within roadless areas.^{16 17}

Geological and Paleontological Resources

Paleontological resources are recognized as important both for their scientific and natural resource values and in terms of the active protection required in their management. Identification of fossil resource probability in an area and the appropriate management prescriptions is accomplished in the land management planning process. Management prescriptions are generally based upon scientific significance of a specimen and sensitivity ranking of a locality. Existing policies regulate the collection and disposition of vertebrate but usually not invertebrate or plant fossils.

Generally, NFS lands are available for collecting rocks and minerals, except on lands withdrawn to prohibit these activities.

Geologic processes such as landslides, earthquakes, or volcanic hazards affect peoples' lives. To enhance public understanding and appreciation of them, the Forest Service may develop interpretive sites to highlight examples of them.

Karst and cave resources occur on areas underlain by limestone or marble or areas having exposed basaltic flows. Some of the values associated with karst and cave resources are their ability to store and transmit groundwater, their importance as subterranean wildlife habitats, their importance as cultural resource or paleontological sites, and their ability to provide interpretive sites or recreational opportunities for spelunkers or cavers. They can also present hazards, such as sinkholes, to resource use and development.

Energy Corridors

Recognizing the fundamental importance of the delivery of energy supplies to the nation's economic well-being, Congress passed Section 368 of the Energy Policy Act of 2005 to require certain federal agencies (Agencies) to designate energy corridors on federal lands in 11 western states, which includes Idaho, and to coordinate with each other to create a cooperative, efficient process for applicants to apply for rights-of-way in such corridors. Congress stated in Section 368 that the Agencies should incorporate the designated corridors into their respective land use or resource management plans. Congress also directed the Agencies to conduct environmental reviews that are required to designate corridors and add the designated corridors to the plans.

To carry out this legislative direction, the Forest Service is participating in preparing a programmatic environmental impact statement (PEIS) to designate energy corridors on land it administers for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities in 11 contiguous western states and to incorporate these designations into affected Agency land use plans. (U.S. Department of Energy, USDI BLM, USDA Forest Service 2005).

None of the Idaho corridors being addressed in the PEIS impact Idaho Roadless Areas.

¹⁶ p. 5-4, USDI BLM, USDA Forest Service, Smoky Canyon Mine, Panels F & G, final EIS; November 2007.

¹⁷ Phosphate Mine Layer, Southeast Idaho Selenium Information System, <http://giscenter-ims.isu.edu/SISP/maps/viewer.htm>

Alternate Energy

The National Energy Policy Act of August 8, 2005, recognized the importance of a diverse portfolio of domestic energy. The law contained thirteen recommendations designed to increase America's use of renewable and alternative energy. One of these recommendations directed the Secretaries of the Interior and Energy to re-evaluate access limitations to federal lands in order to increase renewable energy production, such as biomass, wind, geothermal, and solar.

Wind Energy

Wind power plants, or wind farms as they are sometimes called, are clusters of wind turbines scattered over a large area for the purpose of generating electricity. A typical wind turbine stands as tall as a 20-story building and has three blades that span 200 feet across. The most serious environmental drawbacks to wind farms may be their negative effect on wild bird populations and the visual impact on the landscape.

Idaho wind resource maps indicate exposed mountain summits and ridge crests within many Idaho Roadless Areas have the sustained wind speeds conducive to run wind turbines. (http://www.eere.energy.gov/windandhydro/windpoweringamerica/maps_template.asp?sta-teab=id) Winter is the season of highest wind power in these areas because mean upper air wind speeds are highest during this season. However, severe icing, access problems, and damaging storm winds severely restrict the suitability of wind energy development for many of the higher mountain summits and ridge crests in [Idaho]¹⁸ (http://www.nrel.gov/wind/resource_assessment.html). In addition to a sufficient wind resource, economical wind power projects need road access and proximity to an electrical transmission line, two features that are generally lacking in most Idaho Roadless Areas. Given the technological, logistical, and environmental issues associated with constructing wind turbines in the more mountainous roadless areas, it is expected these areas have low potential and there would be little interest in developing wind energy projects in Idaho Roadless Areas.

Wood Biomass

The Departments of Agriculture and Interior are implementing the National Fire Plan, the President's Healthy Forests Initiative, the Healthy Forests Restoration Act and the Tribal Forest Protection Act of 2004 to address the risk of catastrophic wildfire and improve forest and rangeland health on federal lands by thinning biomass density. Complementing this effort, in June 2003, the Departments of Energy, Interior, and Agriculture announced an initiative to encourage the use of woody biomass from forest and rangeland restoration and hazardous fuels treatment projects. The three Departments signed a Memorandum of Understanding (MOU) on Policy Principles for Woody Biomass Utilization for Restoration and Fuel Treatment on Forests, Woodlands, and Rangelands, supporting woody biomass utilization as a recommended option to use to reduce hazardous fuels rather than burning or employing other on-site disposal methods

The technology to generate energy from wood has expanded tremendously in the wake of price increases in fossil fuel. Business or residential use of wood biomass for the generation of heat or electrical energy can be economical if there is an adequate supply of wood product within a reasonable distance -- hauling wood biomass from outside a 50-mile radius is usually not

¹⁸ Wind Energy Resource Atlas of the United States, US Department of Energy, October 1986.

economical.¹⁹ Transportation for delivering from the supply site to the wood combustion or wood-processing unit is the primary expense of wood fuel. It is anticipated that any medium- to large-scale wood biomass projects in roadless areas would not be conducted independently, but in conjunction with a timber harvest or fuels treatment project. Road access would be an essential requirement for any such biomass projects to allow the product to be transported to the facility where it would be utilized. Furthermore, only those timber harvest or fuels treatment projects within an economically feasible distance of the point of utilization would be suitable as a joint venture with a biomass project.

Environmental Consequences

Effects Common to All Alternatives

Locatable Minerals

Construction or reconstruction of roads for locatable mineral exploration or development is part of the reasonable right of access provided under the General Mining Laws. Therefore, none of the three alternatives will affect this statutory right of reasonable access to prospect and explore lands open to mineral entry and develop valid claims.

All proposals for locatable mineral exploration or development would be subject to the planning and design requirements governing locatable minerals in 36 CFR 228, Subpart A. If proposed activities will likely cause significant disturbance to NFS surface resources, a Plan of Operations would be required of the mining operator, and the appropriate level of analysis of environmental effects would be conducted under NEPA. Upon completion of the environmental analysis, the plan of operations would be approved subject to any modifications necessary to minimize adverse impacts on National Forest surface resources and would be binding on the operator.

Under all alternatives, an estimated average of 1 mile or less per year of road construction or reconstruction is projected to occur in Idaho Roadless Areas during the next 15 years for all non-timber related activities, including mineral activities, such as access to locatable minerals and exploration within existing lease areas.

Leasable Minerals

Phosphate—None of the alternatives would prohibit road construction or reconstruction associated with developing the existing leases on the Caribou-Targhee National Forest or the continuation, extension, or renewal of these leases. All of the existing phosphate leases within roadless areas in Idaho were issued before January 12, 2001, the effective date of the RACR. Roads may be developed both on and off of these leases when they are reasonable and necessary for access and development, including associated product conveyance lines.

Consequently, the reasonably foreseeable road construction and mining disturbance associated with developing existing leases at the proposed Smoky Canyon mine expansion is expected to occur within the Sage Creek and Mead Peak Roadless Areas under all of the alternatives. This activity would result in 1,100 acres of disturbance to the Sage Creek and Mead Peak roadless areas over the next 15 years.

¹⁹ Wood Biomass for Energy, USDA Forest Service, Forest Products Laboratory, April 2004.

Projecting beyond the Smoky Canyon mine expansion, it is reasonable to assume that the remaining leased phosphate resources available to be mined, roughly 6,100 acres, within seven Idaho Roadless Areas (Dry Ridge, Huckleberry Basin, Meade Peak, Sage Creek, Schmid Peak, Stump Creek, and Mount Jefferson) will also be mined. Using the Smoky Canyon expansion as an example of the level of expected activity, an estimated 17.2 miles of haul road construction and other surface mining disturbance would ultimately take place within these seven roadless areas. This disturbance is assumed to be spread out over an extremely long period of time (50 or more years) as mines are eventually permitted and developed.

Geological and Paleontological Resources

The geologic and paleontological resources described in the Affected Environment section of this document are not predicted to result in any new road construction or reconstruction in Idaho Roadless Areas. Accordingly, no effects under the Proposed Action or any alternative are expected.

Abandoned and Inactive Mines

None of the alternatives provide an exception to the road construction or reconstruction restrictions to conduct mine closure activities solely for the purpose to remedy public safety concerns. Accordingly, any abandoned mines that are a public safety hazard, but not a CERCLA hazard, could not be properly dealt with if road construction or reconstruction was an integral part of the site remedy and the site was within a roadless area subject to road restrictions. The actual number of the 315 inventoried sites that may meet these criteria is not known at this time.

Alternate Energy

Idaho Roadless Areas are predicted to have low potential for developing wind energy. Consequently, the prohibitions on road construction or reconstruction under any of the alternatives should have minimal impact on wind energy development in Idaho Roadless Areas.

The ability to use wood biomass for energy is critically dependent on having road access. Furthermore, the haul distance from source to end use is an equally critical factor. Given the combination of these factors, it is assumed that medium- to large scale- biomass projects would likely be economic within Idaho Roadless Areas only if they are conducted in conjunction with timber harvest or fuels treatment projects that: 1) use or build roads; and 2) are in close proximity to a point where the biomass would be utilized. Therefore, the potential for using wood biomass under the various alternatives would be intimately related to the potential for those timber harvest and fuels treatment projects that would use or build roads (see Specialist's Report for Vegetation and Forest Health and Fuel Management).

Effects that Vary by Alternative

2001 Roadless Rule

Leasable Minerals

The 2001 Roadless Rule did not prohibit mineral leasing in Idaho Roadless Areas, but did prohibit the construction or reconstruction of roads associated with leases issued after January 12, 2001, the date the rule was published. Proposals for exploration or development of leasable minerals using existing roads or not requiring road construction or reconstruction were still allowed within roadless areas under the 2001 Roadless Rule. Prohibition of road construction or reconstruction in roadless areas would factor into the analysis of lands available for lease when leasing decisions are made.

Although leasing isn't prohibited under the 2001 Roadless Rule, the prohibition of road construction or reconstruction severely limits the opportunity for operators to explore and develop leasable mineral resources that may exist in roadless areas. This is because the density and location of existing roads is usually not adequate for that purpose. There would be very little, if any, commercial interest in leasing minerals subject to these kinds of restrictions. With no interest in leasing, the mineral resources would not be developed.

Geothermal-- There are no existing geothermal leases on Idaho Roadless Areas. Therefore, there would be no new roads developed under the specific exemption in the 2001 Roadless Rule for that purpose. Any new leases issued would be subject to the 2001 Roadless Rule road prohibitions. Assuming the density of existing roads within roadless areas is not adequate to explore and develop geothermal resources, it is expected there would be little commercial interest in geothermal leasing. This expectation is based on the reaction of Utah oil and gas lessees, who requested a suspension of their leases upon learning that their leases were subject to the roadless rule provisions, claiming they were prevented from operating on their leases.

Exploration methods used for geothermal are similar to those used for oil and gas. Consequently, little development of geothermal resource potential is expected on the 9.3 million acres of Idaho Roadless Areas. About 10.6 million acres of NFS lands outside Idaho Roadless Areas with high to moderate geothermal potential may be available for exploration and development, depending on the existing plan direction (table 1). The impact on the recovery of geothermal resources cannot be quantified because there is no specific resource estimate from which to draw.

Oil and Gas – The Caribou-Targhee National Forest is the only forest with potential for oil and gas activity in the foreseeable future (next 15 years). There is currently one oil and gas lease on the Forest in the Bear Creek Roadless Area, but it was issued in 2007 and therefore is subject to the 2001 Roadless Rule provisions. Therefore, no roads could be constructed or reconstructed to access existing lease rights.

The Targhee portion of the Caribou-Targhee National Forest issued an oil and gas leasing decision in 2000 that either precludes leasing or places a NSO stipulation on leases that are within the roadless areas on the Targhee. Therefore, the 2001 Roadless Rule road construction or reconstruction prohibitions coupled with the restrictions imposed by the existing oil and gas leasing decision makes it unlikely there would be any oil and gas development within the Targhee portion of the Forest.

The 2001 Roadless Rule would also likely preclude oil and gas development in roadless areas on the Caribou portion of the Caribou-Targhee National Forest as there would be little commercial interest in leasing areas where road construction/reconstruction would not be permitted to access new leases. This expectation is based on recent action taken by oil and gas lessees in Utah's Uinta National Forest. Upon learning that their leases would be subject to the reinstated 2001 Roadless Rule, these lessees requested that BLM suspend their leases, asserting that they were "prevented from operating on the leases."

If the four exploratory wells projected in the Caribou's reasonably foreseeable development scenario would need new road construction or reconstruction, they would have to be located outside roadless areas. However, based on the U.S. Geological Survey's assessment that there is low potential for undiscovered resources in southeast Idaho, the impacts of the 2001 Roadless Rule on oil and gas resource recovery from roadless areas should be minimal.

Phosphate—Under the 2001 Roadless Rule, road construction and reconstruction would be prohibited on the 14,460 acres of unleased KPLA that are within Idaho Roadless Areas on the Caribou-Targhee National Forest. This assumes BLM would issue any new leases with a stipulation that would subject the lease to the 2001 Roadless Rule road prohibitions; therefore it is expected there would be no commercial interest in new phosphate leasing within roadless areas. Accordingly the phosphate reserves on this acreage would not be mined because roads could not be built to support advance drilling needed to specifically define the mineable deposit.

Although mining on these lands is not expected to occur in the foreseeable future, this alternative would have the long term impact of foregoing the recovery of an estimated 651 million tons of phosphate resource. This is a rough estimate assuming an average of 45,000 tons of recoverable phosphate ore from each acre mined and applying this average to the entire 14,460 unleased acres. This recoverable reserve figure is based on typical recovery rates of existing mines in the area and is subject to significant variation depending on actual conditions encountered should these lands be mined.

In addition to unleased lands within KPLA's, undiscovered phosphate resources that may exist within other portions of Idaho Roadless Areas but are outside of KPLA's, would not be adequately explored to determine if economic reserves exist. No estimate of recoverable phosphate is made for Idaho Roadless Areas outside of KPLA's because the extent of the resource is not known for these areas.

Saleable Minerals

The 2001 Roadless Rule prohibits road construction or reconstruction associated with developing new mineral material sites within Idaho Roadless Areas.

It is possible that new mineral material sites or expansion of existing sites could occur within Idaho Roadless Areas to provide material for new road construction or reconstruction associated with any of the exceptions under the 2001 RACR or for use on other Forest Service projects. Such mineral material sites would have to be developed along an existing road or adjacent to a road being built under one of the exceptions to the rule. This is expected to be a rare circumstance.

Because there has historically been little interest in the use of mineral materials from Idaho Roadless Areas, except for relatively small volumes for Forest Service projects, the effects on the production of this resource under the 2001 Roadless Rule should be minimal.

Abandoned and Inactive Mines

One of the exceptions under the 2001 Roadless Rule provides for the construction or reconstruction of roads needed to conduct a response action under CERCLA or to conduct a natural resource restoration action under CERCLA, Oil, and Hazardous Substance Liability – Sec. 311 of the Clean Water Act, or the Oil Pollution Act.

Therefore, under this alternative, the Forest Service or other responsible entities will continue to respond to CERCLA violations that may be encountered at the 315 abandoned mines, quarries, and other mineral sites that have been currently identified within 66 roadless areas in Idaho as well as at any sites identified in the future. Construction or reconstruction of any necessary temporary roads for this activity would be permissible. The exact number of these identified sites that may result in CERCLA violations is not known until site specific assessments are completed.

Existing Plans

Leasable Minerals

Under this alternative, management of leasable mineral resources in Idaho roadless areas would be guided by each forest's land and resource management plan. If one doesn't already exist, environmental impact statements are usually prepared on a forest-wide basis to address leasing decisions. Areas with management prescriptions to protect roadless area values either may not be leased, may be leased with a no-surface occupancy stipulation, or may generate a forest plan amendment. Areas with management prescriptions that allow road construction or reconstruction may be leased subject to standard lease terms and any other supplemental stipulations deemed appropriate and necessary by the Forest Service.

Geothermal— Without any trend data for geothermal exploration and development activities on NFS lands in Idaho, it is too speculative to predict the amount of new road construction/reconstruction that would occur in Idaho Roadless Areas under Existing Plans. Some level of exploration and development may occur if road construction or reconstruction is not prohibited under a specific forest plan prescription and if surface occupancy is allowed. Table 4 provides a summary of Idaho Roadless Area acreage by geothermal resource potential and forest plan prescriptions grouped into equivalent State management themes. The impact to the recovery of geothermal resources cannot be quantified for any of the themes discussed here because there is no specific resource estimate to draw from.

Table 4. Acres of Idaho Roadless Areas by Existing Plan theme equivalent and geothermal resource potential

Existing Plan theme equivalent	Acres of geothermal resource potential			
	High	Medium	Low	Total
Wild Land Recreation	824,000	460,600	35,900	1,320,500
Primitive	1,343,600	434,500	126,200	1,904,300
Backcountry	2,098,600	2,139,300	245,100	4,483,100
GFRG	387,000	797,600	77,900	1,262,500
Forest plan special areas	184,100	129,600	20,500	334,200
	4,837,300	3,961,600	505,600	9,304,400

None of the Forests in Idaho have a current leasing decision for geothermal, which would need to be completed for lands could be offered. Leasing decisions would take into account roads standards for respective forest plan prescriptions and identify other required lease stipulations to protect surface resources. One such stipulation would likely be no surface occupancy on slopes steeper than 40 percent. Table 5 shows the IRA acreage where surface occupancy or road building would be allowed because slopes are less than 40 percent. About 50 percent of Idaho Roadless Areas are less than 40 percent slope.

Table 5. Acres of Idaho Roadless Areas by Existing Plan theme equivalent and geothermal resource potential with slopes less than 40 percent¹

Existing Plan theme equivalent	Acres of geothermal resource potential with slopes less than 40 percent			
	High	Medium	Low	Total
Wild Land Recreation	306,300	203,900	15,200	525,400
Primitive	602,500	196,900	49,300	848,700
Backcountry	1,187,400	1,061,500	105,200	2,354,100
GFRG	249,100	458,000	30,700	737,800
Forest plan special areas	89,500	60,200	10,100	159,800
Totals	2,434,800	1,980,500	210,400	4,625,800

¹Based on overlay of the SMU map with the Existing Plan themes.

Geothermal resources under the forest plan management prescriptions similar to Wild Land Recreation, Primitive, and most forest plan special areas are not expected to be developed because of prohibitions on road construction or reconstruction. This expectation is based on the experience with certain oil and gas lessees in Utah who believe they cannot develop a lease without the ability to construct new roads. The methods used to explore for geothermal are similar to those used in oil and gas. Furthermore, the density of existing roads is probably not adequate to explore and develop the geothermal resource in these areas. It is also likely that in large portions of these areas, surface occupancy would not be allowed to avoid steep slopes and to protect other sensitive surface resources, further supporting the prediction that no development would occur. These areas constitute about 38 percent of Idaho Roadless Areas.

Under the forest plan management prescriptions similar to the Backcountry theme, road construction or reconstruction would be permissible only under limited circumstances on some of the lands and precluded completely on other portions. Some forest plans—such as the Boise, Payette, and Sawtooth—preclude road construction or reconstruction for new leases (see appendix B in FEIS). On those lands where new or reconstructed roads are precluded, there would not likely be any geothermal leasing or associated activities. Given that road construction

or reconstruction could occur in at least some of the Backcountry lands, there is potential that some level of geothermal activity would occur. If fully developed, roads, transmission lines, and other facilities would likely be constructed (see Affected Environment section for a description of general development of geothermal resources). The Backcountry theme contains a substantial amount (48 percent) of the roadless areas with geothermal potential, with the majority being high and medium potential. About 51 percent of Idaho Roadless Areas in the Backcountry theme have slopes less than 40 percent and could have some potential for development (table 5), provided road construction or reconstruction is permitted.

Management prescriptions in Existing Plans similar to the GFRG theme would permit road construction or reconstruction to access mineral leases. The amount of activity would be relative to the amount of land available. GFRG lands constitute 14 percent of the total roadless areas in the State. About 58 percent of Idaho Roadless Areas in GFRG have slopes less than 40 percent (table 5). These lands have potential to host some level of geothermal activities because of the open access. Any future exploration or development would undergo separate environmental analysis. If fully developed, roads, transmission lines, and other facilities would likely be constructed (see Affected Environment Section for a description of general development of geothermal resources).

Currently lease applications have been submitted for geothermal development, which could affect 7,000 acres of the Peace Rock Roadless Area on the Boise National Forest and 33 acres of the West Panther Roadless Area on the Salmon National Forest. Lands in the Peace Rock Roadless Area are in management prescriptions similar to Backcountry, and lands in the West Panther Roadless Area are in management prescriptions similar to GFRG. These areas could be made available for leasing depending on the outcome of a site specific leasing analysis and decision; development as described in the Affected Environment section could then occur.

Oil and Gas— The Caribou-Targhee National Forest is the only forest with potential for oil and gas activity in the foreseeable future (next 15 years). The Targhee portion of the forest issued a decision in 2000 that either precludes leasing or places a NSO stipulation on the roadless areas on the Targhee. Without either a lease or the ability to occupy the surface, it is unlikely that oil and gas wells could be constructed within roadless areas on the Targhee.

The Caribou portion of the forest is conducting an analysis to decide which NFS lands would be made available for leasing and under what terms and conditions (USDA Forest Service, USDI BLM 2006). Under the Existing Plan management prescriptions, road construction is permissible on approximately 251,900 acres of the 741,700 acres in roadless areas. A portion of the Forest's 369,300 managed under Backcountry-equivalent prescriptions may also be available to allow road building for oil and gas. Despite the availability of these roadless areas and the 450,200 acres of non-roadless areas, oil and gas activity is still predicted to be low for the foreseeable future if leases are issued. With the low potential for recoverable oil and gas reserves in southeast Idaho, the lack of access to those roadless areas in the forest where road construction/reconstruction is prohibited should have minimal impact on the recovery of oil and gas resources.

Phosphate-- The existing Forest Plan covering the Caribou portion of the Caribou-Targhee National Forest allows for leasing of the estimated 6, 750²⁰ acres of unleased known phosphate

²⁰ Estimate assumes 840 acres of unleased KPLA in Sage Creek Roadless Area which the Forest Service recommended unavailable for leasing per 1998 leasing analysis would not be leased.

lease areas (KPLAs) and/or other possible roadless areas that contain undiscovered phosphate resources. Unleased KPLAs in the forest plan have a dual management prescription. In addition to the variety of prescriptions that apply to surface resources, the forest plan recognizes KPLA lands as having potential to be leased for phosphate exploration and possible mining. If industry makes a request to lease KPLA acreage, BLM and the Forest Service would complete an environmental analysis before BLM makes its decision on the request. If BLM then decides to issue leases and mining is approved, the forest plan calls for the lands to then be managed under the prescription for active phosphate mines. The Forest Plan prescription for mining includes a half-mile buffer around the KPLA to accommodate support facilities or developments, including lease modifications or fringe acreage leases, which could be needed for mine activities. If phosphate leases are approved, they would be allowed reasonable access when future exploration drilling and mining is permitted. Reasonable access in these instances may include road construction or reconstruction within additional roadless areas beyond the half-mile buffer around KPLAs, but this is expected to occur only minimally. Using the Smoky Canyon expansion as an example of the level of expected activity, roughly 98 percent of the total amount of haul road construction necessary for a given mining project would ultimately take place within the half-mile buffer around KPLAs and in roadless areas.

The 6,870 acres of unleased KPLA in the Targhee portion of the Caribou-Targhee National Forest would have to undergo a NEPA analysis prior to making a decision on how much could actually be leased.

There is expected to be little or no demand for unleased KPLA acreage within roadless areas for the foreseeable future (within the next 15 years) because of the amount of reserves the industry already has under lease. However, in the long term (50 or more years) it is reasonable to assume that all 13,620 acres of unleased KPLA within Idaho Roadless Areas contain mineable reserves and would eventually be leased. This is an overly conservative as some KPLA acreage would likely not be leased due to unfavorable geologic, environmental, or logistical conditions. If this should occur, roads, pits, and other surface mining facilities would be expected to be constructed within these roadless areas. This disturbance would spread out over an extremely long period of time (50 or more years) as mines are developed. If all of the unleased KPLAs are leased, there would be a potential to incrementally affect the total roadless area acreage of the Caribou-Targhee forest by less than one percent.

The history of phosphate development in the area has shown that lease modifications or fringe acreage leases are a regular occurrence to avoid the waste of isolated blocks of phosphate ore. These lease types could include lands that are either unleased KPLA or lands that are within the ½-mile buffer surrounding the unleased KPLA. Using a ratio of existing leased acres outside of KPLA to leased acres inside of KPLA throughout the Caribou-Targhee National Forest, it can be estimated that the buffer area around unleased KPLA's could contribute up to an additional 14 percent, or about 1,910 acres, to lands where mining may occur.

In roadless areas beyond the ½-mile buffer surrounding KPLA's, the potential for phosphate-related activities would depend upon: 1) if the lands were prospectively valuable for phosphate; and 2) whether or not a Forest's management prescription allowed road construction or reconstruction and surface occupancy.

Saleable Minerals

About 1.26 million acres, or 14 percent of the total Idaho Roadless Areas, are within management prescriptions similar to the GFRG theme. These GFRG prescriptions permit road construction or reconstruction to develop or expand mineral material sites. Under most other Existing Plan prescriptions equivalent to the Wild Land Recreation, Primitive and Backcountry themes, road construction or reconstruction for mineral material purposes could occur only under very limited circumstances.

Even with the access permitted under the GFRG theme, the remoteness of roadless areas and the widespread availability of mineral material sources outside of roadless areas, create a reasonable expectation that only a minimal volume of mineral materials would come from Idaho Roadless Areas. Assuming the demand for mineral materials remains at current levels, this trend should continue; low volumes of mineral materials would be produced from roadless areas, the principal uses being for Forest Service projects or for the limited instances when roads are constructed within roadless areas. Given this predicted low level of production from roadless areas, the effects on saleable mineral production under this alternative would be minimal.

Abandoned and Inactive Mines

Under Existing Plans, the Forest Service and other responsible entities would continue to respond to CERCLA violations and/or safety hazards at abandoned mines, quarries, and other mineral sites that are located within roadless areas where road construction or reconstruction is permissible and a road is needed for to complete the project. A forest plan could be amended to permit road construction/reconstruction if road access is necessary to respond to problems at a site in areas with management prescriptions that prohibit new roads. Table 6 reflects abandoned mines and facilities that have been identified to date within Idaho roadless areas, broken down by their location within equivalent forest plan prescriptions.

Table 6. Number of abandoned mine/facility sites by under the Existing Plan by theme

Theme	Existing plans no. of mine/facility sites
Wild Land Recreation	18
Primitive	31
Backcountry	203
GFRG	55
SAHTS	0
Forest plan special areas	8
Total	315

Proposed Idaho Roadless Rule (Proposed Action)

Leasable Minerals

Under the Proposed Idaho Roadless Rule, the Forest Service would not recommend, authorize, or consent to road construction/reconstruction for new mineral or energy leases in Idaho Roadless Areas managed under the Wild Land Recreation, Primitive, and SAHTS themes. These areas constitute 3,101,500 acres, or 33 percent of the total roadless area acreage in the State. The

Proposed Rule would also not recommend, authorize or consent to authorize surface occupancy in the Wild Land Recreation, Primitive, and SAHTS themes.

The Proposed Rule also would prohibit road construction/reconstruction in the Backcountry theme, except as associated with phosphate leasing. Surface occupancy without road construction/reconstruction would be permissible for all mineral leasing. The Proposed Rule would permit both surface occupancy and road construction/reconstruction for development of phosphate resources in the Backcountry theme.

The GFRG theme would permit both surface occupancy and road construction or reconstruction for all leasable mineral activities.

Geothermal—Table 7 identifies the acres of Idaho Roadless Areas allocated by resource potential and Proposed Rule theme. Geothermal resources under the Wild Land Recreation, Primitive, and SAHTS themes, as well as forest plan special areas, would not be developed because no surface occupancy and no new roads are permitted. NSO means a lessee could not construct surface locations for wells on any leases issued. Directional drilling could be used to explore portions of NSO leases adjacent to areas where surface occupancy may be permissible. However, the large expanse of the involved roadless areas renders them virtually impossible to economically explore and develop entirely via directional drilling methods. It is not expected that the industry would incur the extra expense of any directional drilling without the promise of the full economic enjoyment of the entire lease area. This is particularly true in relatively unexplored areas such as Idaho's roadless areas, where complex geology and lack of known commercial production greatly increase the financial risk of drilling.

The Proposed Rule would permit surface occupancy within the Backcountry theme but prohibits road construction or reconstruction for geothermal resources. Despite the ability to occupy the surface, it is expected there would be little commercial interest in leasing lands under this theme because of the road prohibition, because experience elsewhere with oil and gas leases, which use similar exploration methods, suggest that operators believe they cannot develop leases without the ability to build roads. Thus, given the restrictions associated with the Wild Land Recreation, Primitive, Backcountry and SAHTS themes, 93 percent of the Idaho Roadless Areas are not expected to experience any activity to develop geothermal resources.

Table 7. Acres of Idaho Roadless Areas by Proposed Rule theme and geothermal resource potential

Idaho Roadless Rule theme	Acres of geothermal resource potential			Total
	High	Medium	Low	
Wild Land Recreation	859,500	475,700	43,000	1,378,200
Primitive	1,372,500	269,700	10,700	1,652,900
Backcountry	2,069,600	2,779,300	410,800	5,259,800
GFRG	351,600	236,500	20,500	608,600
SAHTS	0	70,700		70,700
Forest plan special areas	184,100	129,600	20,500	334,200
	4,837,300	3,961,500	505,500	9,304,300

Table 8. Acres of Idaho Roadless Areas by Proposed Rule theme and geothermal resource potential with slopes less than 40 percent

Idaho Roadless Rule theme	Acres of geothermal resource potential with slopes less than 40 percent			
	High	Medium	Low	Total
Wild Land Recreation	319,700	218,300	15,900	553,900
Primitive	618,200	138,100	4,900	761,200
Backcountry	1,174,200	1,380,100	171,000	2,725,300
GFRG	233,100	140,700	8,600	382,400
SAHTS	0	43,200	0	43,200
Forest plan special areas	89,500	60,200	10,100	159,800
Total	2,434,700	1,980,600	210,500	4,625,800

Under the Proposed Rule, geothermal activity on lands in the GFRG theme would be permitted to occupy the surface and to construct or reconstruct roads. GFRG lands constitute 7 percent of Idaho Roadless Areas, with the majority having high to medium resource potential. As discussed earlier, the Forest Service would perform a leasing analysis prior to leasing geothermal resources. One specific lease stipulation that is commonly required to be made a part of any issued leases is that no surface occupancy be allowed on slopes that are 40 percent or greater. As shown in table 8, about 63 percent of Idaho Roadless Areas in the GFRG theme have slopes that are less than 40 percent and would allow surface occupancy for geothermal. Given the aforementioned characteristics, it is reasonable to expect that lands in the GFRG theme would experience some level of road construction or reconstruction to support geothermal activities sometime in the future.

Currently, lease applications have been submitted for geothermal development including 7,000 acres of the Peace Rock Roadless Area on the Boise National Forest and 33 acres of the West Panther Roadless Area on the Salmon National Forest. The requested lands in both the aforementioned roadless areas are in the Backcountry theme. Geothermal resources are unlikely to be developed on these areas because the theme would prohibit road construction and reconstruction to access the geothermal resource. Experience elsewhere with oil and gas leases, which use similar exploration methods, suggest that operators believe they cannot develop leases without the ability to build roads.

Oil and Gas—The Caribou-Targhee National Forest is the only forest, in Idaho with potential for oil and gas activity in the foreseeable future (next 15 years). The Targhee portion of the

forest issued a decision in 2000 that either precludes leasing or places a no surface occupancy (NSO) stipulation on any leases issued within the roadless areas on the Targhee. Without a lease, industry would have no authority to locate upon or drill wells to explore for oil and gas. An NSO stipulation means a lessee could not construct surface locations for wells on the lease. Without either a lease or the ability to occupy the surface, it is unlikely oil and gas wells would be constructed within roadless areas on the Targhee. Directional drilling could be used to explore portions of NSO leases adjacent to areas where surface occupancy may be permitted. However, the large expanse of the Targhee's NSO areas renders them virtually impossible to economically explore and develop entirely via directional drilling methods. It is not expected that the industry would incur the extra expense of any directional drilling without the promise of the full economic enjoyment of the entire lease area. This is particularly true in relatively unexplored areas such as Idaho's roadless areas, where complex geology and no known commercial production greatly increase the financial risk of drilling.

The Proposed Rule prohibits surface occupancy and road construction or reconstruction for new oil and gas leases within the Wild Land Recreation (42,100 acres) or Primitive theme (44,400 acres) found on the Caribou portion of the Caribou-Targhee National Forest²¹. Similar to the previous discussion regarding the impact of the Targhee leasing decision, these prohibitions would preclude exploration and development of oil and gas resources in these areas because the large expanse of these areas would make it virtually impossible to develop the resource without occupying the site.

The Proposed Rule would permit surface occupancy within the Backcountry theme but prohibits road construction or reconstruction for new oil and gas leases (369,400 acres). Despite the ability to occupy the surface, it is expected there would be little commercial interest in leasing lands under this theme because of the road prohibition. This expectation is based on the recent experience with certain oil and gas lessees in Utah who requested BLM to suspend the terms of their leases in roadless areas because they stated they could not develop the leases without the ability to construct new roads.

The Proposed Rule would permit surface occupancy and road construction or reconstruction for oil and gas exploration and development within roadless areas managed under the GFRG theme (251,800 acres). All but two of the roadless areas on the Caribou portion of the Caribou-Targhee National Forest have some GFRG acreage which should provide opportunities to locate exploratory wells to test the resource potential of these areas of the forest. Oil and gas exploration would likely occur on lands in GFRG within roadless areas, or the 450,200 acres of non-roadless lands. Although only 34 percent of the roadless areas in the Caribou portion of the forest would be eligible to host any oil and gas activity, the impact on recovery of oil and gas resources under the Proposed Rule is expected to be low because of the low potential for recoverable oil and gas reserves in southeast Idaho.

Phosphate— There are 14,460 acres of unleased KPLA on the Caribou-Targhee National Forest (see table 9). About 13,190 acres (91 percent) of this total would be managed under the Proposed Rule Backcountry and GFRG themes. Under these themes, road construction or reconstruction would be permissible to develop phosphate resources. Consequently, any unleased KPLA's

²¹ Oil and gas surface occupancy and road construction/reconstruction are also prohibited in the SAHTS theme; however, the Caribou portion of the Caribou-Targhee National Forest does not contain any roadless areas designated under the SAHTS theme.

within these two themes could be leased to provide for the mining of phosphate reserves. Assuming this available acreage is leased and fully developed, roughly 593 million tons of phosphate could potentially be recovered²². About 1,280 acres of known unleased deposits located in the Primitive theme would not likely be leased and developed because of the road prohibitions.

Table 9. Acres of Existing Phosphate Leases and Unleased KPLA acreage in Idaho Roadless Areas by Proposed Idaho Roadless Rule theme (acres rounded to nearest 10th)

Idaho Roadless Area	Acres of Leased Phosphate and Unleased KPLA							
	Wild Land Recreation		Primitive		Backcountry		GFRG	
	Leased	Unleased KPLA	Leased	Unleased KPLA	Leased	Unleased KPLA	Leased	Unleased KPLA
Caribou portion of the Caribou-Targhee National Forest								
Dry Ridge					1,220	570	180	210
Huckleberry Basin							2,090	2,120
Meade Peak			50	900			500	1,570
Sage Creek					230	550	1,670	1,530
Schmid Peak					40			20
Stump Creek					80	40	80	80
Caribou Total			50	900	1,570	1,160	4,520	5,530
Targhee portion of the Caribou-Targhee National Forest								
Bald Mountain						1,430		
Bear Creek						4,160		910
Poker Peak				380				
Mount Jefferson			1,090					
Targhee Total			1,090	380		5,590		910
Forest Totals			1,140	1,280	1,570	6,750	4,520	6,440

The history of phosphate development in the area has shown that lease modifications or fringe acreage leases are a regular occurrence to avoid the waste of isolated blocks of phosphate ore. Some of these lease types could be issued for lands surrounding the unleased KPLA under this alternative. Using a ratio of existing leased acres outside of KPLA to leased acres inside of KPLA throughout the Caribou-Targhee, it can be estimated that areas around unleased KPLA's could contribute up to an additional 14 percent, or about 1,850 acres, to lands where mining may occur.

There would be no near-term impacts on the recovery of phosphate resources under the Proposed Rule because the foreseeable development would occur on existing leases within the Backcountry and GFRG themes, which are not subject to the road construction/reconstruction prohibitions. The longer term impact would be the potential loss of recoverable phosphate from

²² Recoverable reserve figure is based on typical recovery rates of existing mines in the area and is subject to significant variation depending on actual conditions encountered should these lands be mined.

the 1,280 acres of KPLA (58 million tons estimated²³) and any yet undiscovered phosphate outside of KPLA's within themes with road prohibitions.

Salable Minerals

The sale of common variety mineral material sales would be prohibited within Wild Land Recreation, Primitive, and SAHTS themes after the effective date of the Proposed Rule. The rule would permit the Forest Service to use mineral materials within these three areas to carry out various Forest Service programs involving construction and maintenance of physical improvements, provided no road construction is needed to access the involved mineral material site.

Road construction/reconstruction associated with developing new mineral material sites would also be prohibited in the Backcountry theme. Sale of mineral materials would still be allowed under this theme when it is from an existing site or incidental to an activity allowed. A new mineral material site would have to be developed along an existing road or adjacent to a road being built under one of the exceptions to the rule. This is expected to be a rare circumstance.

Under the GFRG theme, road construction and reconstruction would be allowed to develop mineral material sites for all types of dispositions (that is, sales, free use, and administrative use).

Even with the access permitted under the GFRG theme and the limited exception under the Backcountry theme, the remoteness of roadless areas and the widespread availability of mineral material sources outside of roadless areas, create a reasonable expectation that only a minimal volume of mineral materials would come from Idaho Roadless Areas. Assuming the demand for mineral materials remains at current levels, this trend should continue; low volumes of mineral materials would be produced from roadless areas, with the principal uses being for Forest Service projects or for the limited instances when roads are constructed within roadless areas. Given this predicted low level of production from roadless areas, the effects on saleable mineral production under this alternative would be minimal.

Abandoned and Inactive Mines

The Idaho Roadless Rule includes an exception that would permit road construction or reconstruction in all themes when provided by statute or treaty or pursuant to reserved or outstanding rights or other legal duty of the United States. Under this exemption roads could be constructed or reconstructed to respond to CERCLA violations. Therefore, under this alternative, the Forest Service or other responsible entities would continue to respond to CERCLA violations that may be encountered at sites identified within any Idaho Roadless Area. Currently, 315 abandoned mines, quarries, and other mineral sites have been identified within 66 of Idaho Roadless Areas (table 10).

Abandoned and inactive mine sites that represent a public safety hazard but not an environmental hazard are not covered by CERCLA or Clean Water Act authorities. It is likely that many of the 315 sites in roadless areas fit this criterion. If so, prohibitions on road

²³ Recoverable reserve figure is based on typical recovery rates of existing mines in the area and is subject to significant variation depending on actual conditions encountered should these lands be mined.

construction or reconstruction may prohibit or delay the Forest Service from taking corrective action at a specific site to reduce a threat to public safety.

Table 10. Number of abandoned mine/facility sites by theme under the Proposed Rule

Theme	Idaho Roadless Rule no. of mine/facility sites
Wild Land Recreation	22
Primitive	33
Backcountry	247
GFRG	5
SAHTS	0
Forest plan special areas	8
Total	315

Modified Idaho Roadless Rule (Preferred Alternative)

Leasable Minerals

Under the Modified Idaho Roadless Rule, the Forest Service would not recommend, authorize, or consent to road construction/reconstruction for new mineral or energy leases in Idaho Roadless Areas managed under the Wild Land Recreation, Primitive, Backcountry and SAHTS themes. These areas constitute 8,563,300 acres, or 92 percent of the total roadless area acreage in the State. The Modified Rule would also not recommend, authorize or consent to authorize surface occupancy in the Wild Land Recreation, Primitive, and SAHTS themes. The Modified Rule would permit surface occupancy for all types of mineral leasing in the Backcountry theme except where prohibited by the forest plan²⁴.

The Modified Rule also would prohibit road construction/reconstruction for all types of leasable mineral activities in the GFRG theme, except to access phosphate deposits. Surface occupancy without road construction/ reconstruction would be permissible for all mineral leasing in the GFRG theme except where prohibited by the forest plan²⁵. Road construction or reconstruction to access phosphate deposits may only be considered after reviewing other access options, and resource needs, and must be consistent with applicable land management plan components.

Oil and Gas. No new road construction or reconstruction to support oil and gas exploration or development would be allowed on new leases under any theme of the Modified Rule. As such, it is anticipated there would be little commercial interest in leasing oil and gas within Idaho Roadless Areas. This projection is based upon a number of the basic assumption for mineral activities that are stated at the beginning of this report. In relatively unexplored areas such as Idaho Roadless Areas, the economic development of oil and gas resources is dependent upon the ability to occupy the surface and the ability to locate access roads where needed. However, given the low potential for recoverable oil and gas within the Caribou-Targhee National Forest

²⁴ (i.e. the oil and gas leasing decision on the Targhee portion of the Caribou Targhee National Forest would apply to surface use and occupancy in the Backcountry theme)

²⁵ (i.e. the oil and gas leasing decision on the Targhee portion of the Caribou Targhee National Forest would apply to surface use and occupancy in the GFRG theme)

(currently recognized as the only Idaho Forest that would host oil and gas activity in the foreseeable future), the impact of this alternative to the recovery of this resource is also expected to be low.

There single active oil and gas lease currently in the Targhee portion of the Forest would not be subject to the road prohibitions of this alternative as it would predate the effective date of this alternative if implemented. However, the lease remains subject to a number of other stipulations to protect surface resources, including no surface occupancy. These stipulations, coupled with the effect of the Modified Rule on leasing adjacent lands, lower the development potential of the lease.

Geothermal. – Similar to the aforementioned discussion for oil and gas, the Modified Rule would result in little commercial interest in geothermal leasing in Idaho Roadless Areas. Consequently, this alternative is expected to preclude any development of the geothermal resource potential on all 9,304,300 acres of Idaho Roadless Areas, much of it considered medium to high resource potential. The impact of this lack of development cannot be reasonably quantified because there is no specific resource estimate to draw from.

Phosphate. Many public comments on the draft EIS expressed concern about the potential impacts of the exception for road construction and reconstruction associated with phosphate leasing throughout the entirety of the Backcountry theme. Responding to these concerns, the Modified Rule alternative focuses the road construction or reconstruction exception to areas in and adjacent to specific Known Phosphate Leasing Areas (KPLA's) in the Caribou-Targhee National Forest in the GFRG theme. Some of these known phosphate areas were redesignated from the Backcountry theme to the GFRG theme while also removing the road construction and reconstruction exception from the Backcountry theme. However, not all KPLA's were placed in the GFRG theme. Some KPLA's remained in the GFRG theme, but were made subject to a prohibition on road construction and reconstruction.

Phosphate-specific features of the Modified Idaho Roadless Rule include:

- KPLA's amounting to 6,500 acres that were in areas of high surface resource values were retained in the Backcountry theme and therefore would not be subject to new roads for phosphate leasing;
- 910 acres of unleased KPLA located in the Bear Creek Roadless Area remained in the GFRG theme to accommodate other management objectives, but are subject to a prohibition on road construction or reconstruction for all mineral leasing activity; and
- Recognizing the need for off lease facilities and potential lease modifications in phosphate mining, a ½-mile buffer surrounds those KPLA's within the GFRG theme where road development for phosphate is allowed – see Figure 5.

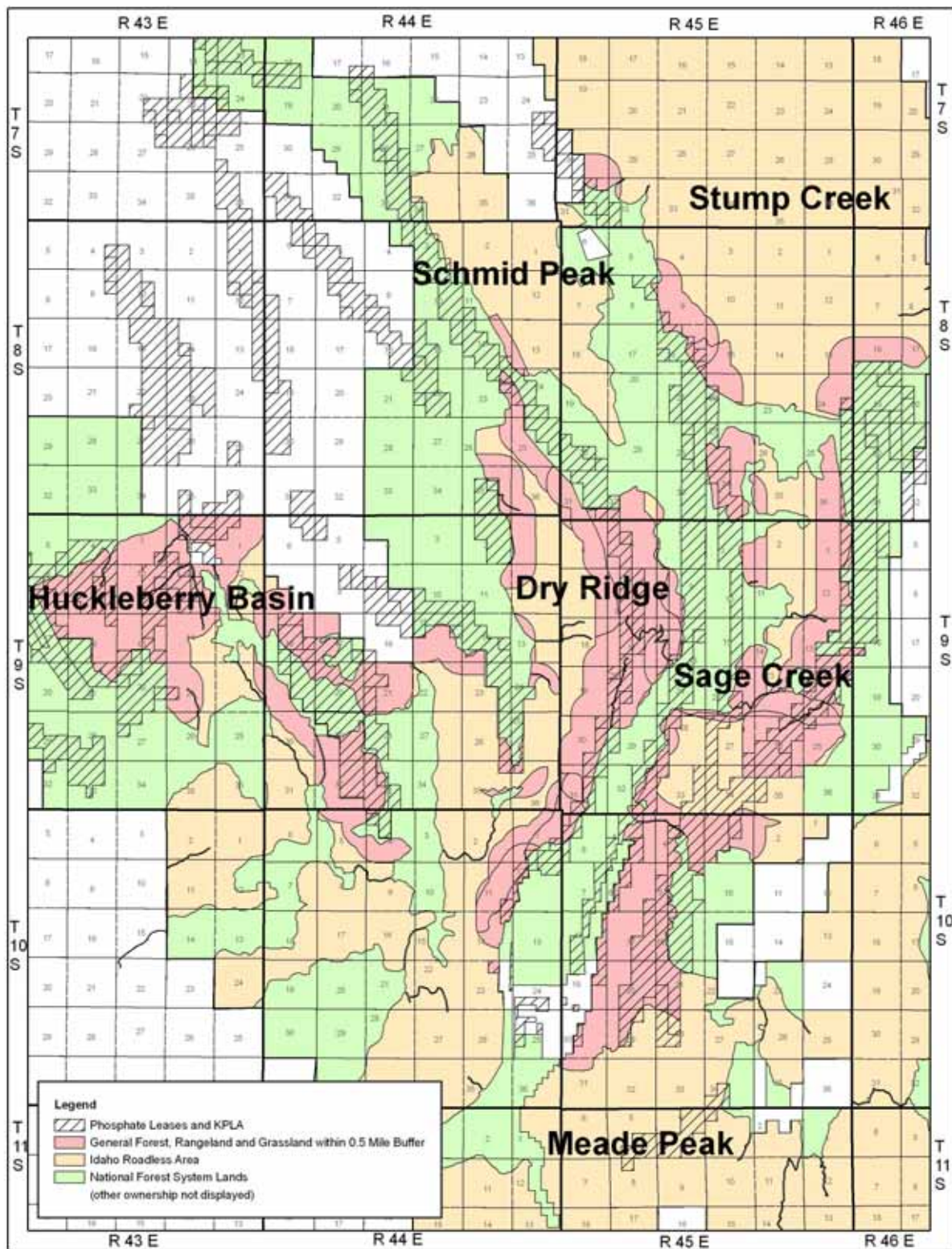


Figure 5. Modified Idaho Roadless Rule Themes and Known Phosphate Lease Areas/Leases in Caribou NF

There would be no near term impact to phosphate recovery under the Modified Rule because development for the foreseeable future would occur on existing leases that predate the rule. For the longer term, the impacts to phosphate recovery under the Modified Rule are evaluated on the basis of the amount of unleased KPLA that can be developed. As shown in Table 11, surface occupancy and road construction or reconstruction would be allowed to develop 5,770 acres of unleased KPLA in the Modified Rule GFRG theme. Assuming this entire acreage is eventually leased and mined, roughly 260 million tons²⁶ of phosphate ore would be recovered. The history of phosphate development in the area has shown that lease modifications or fringe acreage leases are a regular occurrence to avoid the waste of isolated blocks of phosphate ore. Some of these lease types could be for lands within the ½-mile buffer surrounding the unleased KPLA under this alternative. Using a ratio of existing leased acres outside of KPLA to leased acres inside of KPLA, it can be estimated that the buffer area around unleased KPLA's could contribute up to an additional 14 percent, or about 812 acres, to lands where mining may occur.

Table 11. Acres of Existing Phosphate Leases and Unleased KPLA in Idaho Roadless Areas by Modified Idaho Roadless Rule theme

Idaho Roadless Area	Acres of Leased Phosphate and Unleased KPLA							
	Wild Land Recreation		Primitive		Backcountry		GFRG	
	Leased	Unleased KPLA	Leased	Unleased KPLA	Leased	Unleased KPLA	Leased	Unleased KPLA
Caribou portion of the Caribou-Targhee National Forest								
Dry Ridge							1,400	780
Huckleberry Basin							2,090	2,120
Meade Peak			50	900		30	500	1,540
Sage Creek						880	1,900	1,200
Schmid Peak					40			20
Stump Creek						0	160	110
Caribou Total			50	900	40	910	6,050	5,770
Targhee portion of the Caribou-Targhee National Forest								
Bald Mountain						1,430		
Bear Creek						4,160		0 ¹
Poker Peak				380				
Mount Jefferson			1,090					
Targhee Total			1,090	380		5,590		0
Forest Totals			1,140	1,280	40	6,500	6,050	5,770

¹ road construction or reconstruction is prohibited on 910 acres of unleased KPLA in Bear Creek Roadless Area under Modified Idaho Roadless Rule

The 8,690 acres of unleased KPLA located in the Backcountry and Primitive theme, and GFRG in the Bear Creek, Bald Mountain, and Poker Peak Roadless Areas would be subject to road construction or reconstruction prohibitions. It is assumed there would be no interest in leasing these lands as industry would be unable to access drill sites to gather information about the ore body for mine evaluation and planning. Consequently the Modified Rule could result in the

²⁶ Recoverable reserve figure is based on typical recovery rates of existing mines in the area and is subject to significant variation depending on actual conditions encountered should these lands be mined.

potential loss of an estimated 390 million tons²⁷ of recoverable phosphate ore and any yet undiscovered phosphate reserves within themes with road prohibitions.

Salable Minerals

Under the Modified Idaho Roadless Rule, the Forest Service may authorize the sale or use of common variety mineral materials and any road construction or reconstruction to access the same only if the use of the mineral materials is incidental to an activity allowed under the rule. The volume of mineral materials used from roadless areas has historically been relatively small even under more permissive authorities. It is predicted the use of mineral materials for activities permitted under the Modified Rule would be an equally small volume. The effects on saleable mineral production from NFS lands in Idaho under this alternative would be minimal.

Abandoned and Inactive Mines

The Modified Idaho Roadless Rule includes an exception that would permit road construction or reconstruction in all themes when provided by statute or treaty or pursuant to reserved or outstanding rights or other legal duty of the United States. Under this exemption, roads could be constructed or reconstructed to respond to CERCLA violations. Therefore, under this alternative, the Forest Service and other responsible entities would continue to respond to CERCLA violations that may be encountered at sites located within any Idaho Roadless Area. Currently, there are 315 abandoned mines, quarries, and other mineral sites identified within 66 Idaho Roadless Areas (table 12).

Abandoned and inactive mine sites that represent a public safety hazard but not an environmental hazard are not covered by CERCLA or Clean Water Act authorities. Many of the 315 sites in roadless areas fit this criterion. If so, prohibitions on road construction or reconstruction may prohibit the Forest Service from taking corrective action at a specific site to reduce a threat to public safety.

Table 12. Number of abandoned mine/facility sites by theme under the Modified Idaho Roadless Rule

Theme	Modified Idaho Roadless Rule No. of mine/facility sites
Wild Land Recreation	22
Primitive	33
Backcountry	248
GFRG	4
SAHTS	0
Forest plan special areas	8
Total	315

²⁷ Recoverable reserve figure is based on typical recovery rates of existing mines in the area and is subject to significant variation depending on actual conditions encountered should these lands be mined.

Cumulative Effects

This report serves basically as a development scenario that feeds into the analysis of environmental consequences for other surface resources. As such, the cumulative effects of the proposed action to the physical, social, and economic environment when added to other past, present, and reasonably foreseeable mineral activities are addressed in the other specialist's reports.

Conclusions

Under all alternatives considered, road construction or reconstruction would be allowed when it is reasonably necessary for locatable mineral activities and leasable mineral activities on existing leases. This will not impinge upon any statutory or existing lease rights, thus avoiding any potential takings issues. Presently, the only existing mineral leases within roadless areas are a single oil and gas lease and a number of phosphate leases in the Caribou-Targhee National Forest.

The most significant mineral-related impact of prohibiting road construction or reconstruction in Idaho's roadless areas would be that it would restrict industry from effectively exploring for geothermal and oil and gas on these lands. Geothermal and oil and gas are most affected because there has been relatively little exploration for these resources to date and there are no existing geothermal leases and only one oil and gas lease on NFS lands within the State. Without road access to conduct exploration, we are unable to expand upon our current knowledge of the nature and extent of geothermal and oil and gas resources within roadless areas. Without more knowledge of these energy resources, it is difficult to accurately identify their development potential and the socio-economic impacts of not developing that potential. This impact is greatest under the 2001 Roadless Rule, but all of the alternatives would cause significant amounts of lands with medium to high potential geothermal and medium potential oil and gas to not be explored.

For Idaho's roadless areas, all of the alternatives should have little impact to the production of salable minerals, the ability to respond to CERCLA problems at abandoned mine sites, and the management of geologic and paleontological sites.

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